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SCOTTISH CRYPTOGAMIC FLORA,

OR

COLOURED FIGURES AND DESCRIPTIONS OF CRYPTOGAMIC PLANTS, BELONGING CHIEFLY TO THE ORDER *FUNGI;*

AND

INTENDED TO SERVE AS A CONTINUATION

OF

ENGLISH BOTANY.

BY

ROBERT K. GREVILLE, LL.D. F.R.S. & F.A.S.E.

MEMBER OF THE WERNERIAN NATURAL HISTORY SOCIETY OF EDINBURGH; OF THE IMPERIAL ACADEMY NATURÆ CURIOSORUM; OF THE NATURAL HISTORY SOCIETY OF LEIPSIC; CORRESPONDING MEMBER OF THE NATURAL HISTORY SOCIETY OF PARIS; OF THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA; HONORARY MEMBER OF THE LYCEUM OF NATURAL HISTORY AT NEW YORK; OF THE YORKSHIRE PHILOSOPHICAL SOCIETY; AND OF THE LIVERPOOL INSTITUTION, &c.

Cui bono hæc omnia?—Ut cognoscamus sapientiam CREATORIS, quæ in minimis non minus elucat, quam in magnis plantis.—DILL.

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SCHIZOPHYLLUM COMMUNE.

Common Schizophyllum.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *FUNGI, Link, Grev.*

GENERIC CHARACTER.

Pileus subtus lamellis radiantibus flabellatis, instructus. Lamellæ duplices, in fasciculis distinctis, marginibus involutis, inæquales, hymenio in pagina exteriori.

Pileus furnished beneath with radiating, flabelliform lamellæ. Lamellæ double, unequal, in distinct bundles, the margins involute. Hymenium in the outer surface of the lamellæ.

SPECIFIC CHARACTER.

SCHIZOPHYLLUM commune;.....

SCHIZOPH. commune, *Fries, Syst. Mycol.* v. 1. p. 330.—*Grev. Fl. Edin. ined.*

APUS alneus, *Gray's Nat. Arr.* v. 1. p. 617.

AGARICUS alneus, *Linn. Fl. Suec.* 1242.—*Sp. Pl.* 1645.—*Schæff. Fung.* t. 246. f. 1.—*Bull. Champ.* p. 381. t. 346. et 581. f. 1.—*Lightf. Fl. Scot.* p. 1029.—*Huds. Fl. Angl.* 2. p. 623.—*Pers. Syn. Fung.* p. 485.—*De Cand. Fl. Franç.* ed. 3. v. 2. p. 134.—*Ejusd. Syn.* p. 28.—*Sow. Fung.* t. 183.—*With. Bot. Arr.* ed. 6. v. 4. p. 370.—*Relh. Fl. Cantab.* ed. 3. p. 544.—*Hook. Fl. Scot.* 2. p. 25.—*Schwein. Fung. Carol.* No. 819.—*Nees' Syst.* t. 22. f. 181.

AGARICUS multifidus, *Batsch. Elench. Fung.* Cont. 1. p. 174. t. 24. f. 126.

AGARICUS radiatus, *Swartz, Prodr.* p. 148.

AGARICUS pectunculis, forma elegans, *Batt. Hist. Fung.* p. 73. t. 38. f. d.

AGARICUS acaulis, squamosus, lobatus et villosus, lamellis dissectis, *Gled. Method. Fung.* p. 134.—*Gerard, Fl. Gallo-prov.* p. 20.—*Wulf. Fl. Borussica,* p. 34.

AGARICUS lamellatus, pectunculi forma, major, *Dill. Cat. Giss.* 192.

AGARICUS squamosum, arboribus adnascens pectunculum mentientibus, &c. *Mich. Gen. Pl.* 122.

AMANITA sessilis, lamellis pulverulentis, bifidis, *Hall. Hist.* 2333.

HAB. On the trunks of trees and on old wood. Scotland, LIGHTFOOT. Dundas Hill, near Edinburgh.—In England, it has been found sparingly, by Mr STACKHOUSE in Salop; by Mr RELHAN at Babraham. It has also been found on wood by the Rev. Mr WATTS and Mr SOWERBY.

Gregarious. *Pileus* very thin, composed of little else than a mass of woolly filaments, sessile, or passing into a very short lateral stipes, nearly plane, more or less circular, subentire or lobed, often growing in an imbricated

manner, and rarely exceeding an inch and a half in breadth. The surface is finely cottony, and pure white or greyish, marked by a few indistinct zones. Beneath, the lamellæ are radiating, subparallel, hairy, coriaceous, and of a reddish-brown or brown-grey colour. *Lamellæ* double; that is, composed of 2 rather remote plates, united at their back, and with their sides involute, so that in a dry state they appear tubular when transversely divided. They are arranged in distinct fasciculi: each double lamella soon after its origin] divides into branches, each of which becomes again subdivided in a fan-like mode; but all these divisions are *within* the original lamella; that is, the outermost plate of the bundle of lamellæ, is continuous, to the margin of the pileus, is larger, and rolled over the inclosed divisions, and placed back to back with the adjoining boundary plate of the next fasciculus. An examination of the figure will render the mode of division more intelligible. *Hymenium* in the exterior surface of the lamellæ. *Sporules* very minute, white.

A very curious fungus, found in every quarter of the globe; and, though extremely different from every known Agaric, was retained in that genus until separated by FRIES. One of its greatest peculiarities is the singular mode of division of the lamellæ, and which it is most difficult to describe. Another equally striking one is their villosity. The tomentose surface of the pileus is so thin, that it has occasionally been accidentally removed; and BULLIARD informs us, that the plant has, in that state, been preserved as an extraordinary and precious rarity.

Fig. 1. *Plants, nat. size.* Fig. 2. *A young one.* Fig. 3. *The inferior surface of the pileus.* Fig. 4. *Lamellæ magnified.* Fig. 5. *Mode of division towards the extremities exhibited; the involute sides of the lamellæ being drawn asunder.* Fig. 6. *Sporules.*

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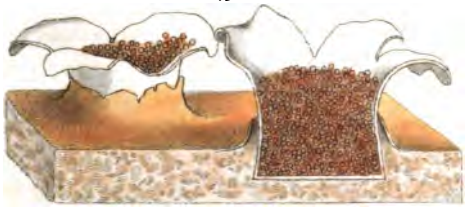

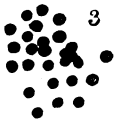

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ÆCIDIUM GROSSULARIÆ.

Gooseberry-leaf Æcidium.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *GASTROMYCI, Grev.*—EPIPHYTÆ, *Link.*

GENERIC CHARACTER.

Peridia in foliis vivis parasitica, membranacea, apice dehiscentia; ore plerumque dentato. Sporidia globosa, minutissima, libera, pulverulenta.

Peridium parasitic on living leaves, membranaceous, bursting at the apex, the mouth generally dentate. Sporidia very minute, free, dust-like.

SPECIFIC CHARACTER.

ÆCIDIUM Grossulariæ; *hypophyllum, in maculam rubram et incrassatam coarctatum; peridiis in lacinias pallidas revolutas dehiscentibus; sporidiis plerumque albidis.*

Æ. hypophyllous, crowded on a red and incrassated spot; peridia bursting into pale revolute segments; sporidia mostly whitish.

ÆCIDIUM Grossulariæ, *De Cand. Fl. Franç.* v. 6. p. 92.

ÆCIDIUM Rumicis, *β, Pers. Syn. Fung.* p. 207.—*Alb. et Schw. Conspect. Fung.* p. 116.—*Moug. et Nestl. Pl. Exsicc.* No. 287.

ÆCIDIUM rubellum, *β, Gmel. Syst. Nat. Linn.* 2. p. 1473.

HAB. On the lower surface of the leaves, and even on the fruit, of the Common Gooseberry, *(Ribes Grossularia)*. Frequent. June.

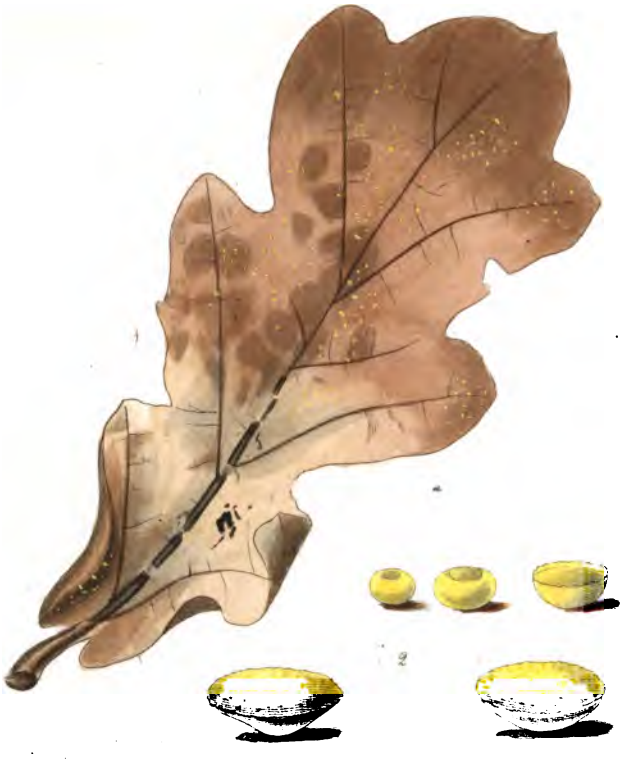
This plant may be recognised at first sight by the bright red spots which it produces on those leaves which it attacks. *Tufts* or spots, 2 or 3 lines broad, mostly crowded with peridia, except in the centre, which is frequently unoccupied. *Substance* of the leaf much thickened; and, if the plant grows on the berry, the latter becomes distorted. *Peridia* depressed, white, with a yellowish tinge, very numerous, splitting into a few, broad, revolute segments, which are sometimes deciduous. *Sporidia* whitish or pale orange.

A plant in some seasons rather destructive to the young fruit of the Gooseberry, though most commonly found upon the leaves.

It was formerly considered as a variety of *Æcidium rubellum* of GMELIN, but appears to differ very essentially,

Æ. rubellum has the peridia always arranged in an annular manner; they are smaller, and the sporidia quite white. In the present species, the annular mode of growth rarely occurs, although there is often a small naked space in the centre of the group, which is as frequently oblong as circular.

Fig. 1. *Clusters of plants, nat. size.* Fig. 2. *Peridia; and,* Fig. 3. *Sporidia, magnified.*



PEZIZA PUNCTIFORMIS.

Minute yellow Peziza.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *FUNGI, Link, Grev.*

GENERIC CHARACTER.

Pileus stipitatus aut sessilis, plus minusve cupuliformis vel complanatis, cellulis elongatis sporuliferis, in pagine superiore.

Pileus sessile or stipitate, dilated upwards into a variable, cup-shaped, or flattish receptacle, having sporules contained in elongated cells, whose summits terminate on the superior surface.

SPECIFIC CHARACTER.

PEZIZA punctiformis; *flava, minutissima, gregaria, punctiformis, globosa, demum explanata, margine crenulato.*

P. yellow, very minute, gregarious, punctiform, globose, at length plane, the margin crenulate.

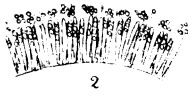
PEZIZA punctiformis, *Grev. Fl. Edin. ined.*

HAB. On dead Oak and Beech leaves, &c. in moist woods, Autumn. Balmuto.

Bright yellow, but extremely minute, gregarious, globose at first, with a small central opening, at length becoming quite plane, or even slightly convex, the extreme margin very thin and crenulate. The substance of the plant is carnose, and the centre rather thick for its size. The whole is glabrous. *Sporuliferous cells* linear-oblong. *Sporules* yellow, difficult to be perceived.

Were it not for a considerable number growing together, this species might escape the eye of a practised mycologist. I have met with it several times, and ascertained its characters to be constant. It not unfrequently accompanies *Phacidium coronatum* and *Sclerotium quercinum*.

Fig. 1. *Plants on an Oak leaf, nat. size.* Fig. 2. *Plants in different states, magnified.* Fig. 3. *Sporuliferous cells.*



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CLAVARIA CINEREA.

Grey Clavaria.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *FUNGI, Link. Grev.*

GENERIC CHARACTER.

Plantæ carnosæ, plus minusve cylindraceæ, simplices vel ramosæ. Hymenium lævе, omnem fere superficiem occupans, cum stipite confluens. Sporulæ albidæ vel ochraceæ.

Carnose plants, more or less cylindrical, simple or branched. Hymenium smooth, occupying almost the whole surface, and confluent with the stem. Sporules white or ochraceous.

SPECIFIC CHARACTER.

CLAVARIA cinerea; *cinerascens vel subpurpurascens; caule crasso, ramosissimo, ramis inæqualibus, subincrassatis, subrugosis, solidis, apicibus obtusis, rarius acutis.*

Cl. grey or purplish; stipes thick, much branched, the branches unequal, somewhat incrassated, subrugose, solid, the summits obtuse, very rarely acute.

CLAVARIA cinerea, *Bull. Champ.* p. 204. t. 354.—*Pers. Syn. Fung.* p. 586.—*De Cand. Fl. Franç.* ed. 3. v. 2. p. 100.—*Ejusd. Syn.* p. 20.—*Fries, Syst. Mycol.* v. 1. p. 468.—*Grev. Brit. Escul. Fung. Wern. Trans.* v. 4.

CLAVARIA grisea, *Pers. Comment.* p. 44.—*Syn. Fung.* p. 586.—*Fries, Obs. Mycol.* 2. p. 289.—*Syst. Mycol.* v. 1. p. 468.

CLAVARIA fuliginea, *Pers. Mycol. Europ.* v. 1. p. 166.

CLAVARIA coralloides, var. 6. *With. Bot. Arr.* ed. 6. (!) v. 4. p. 438.

RAMARIA grisea, *Gray's Nat. Arr.* v. 1. p. 656.

HAB. Woods and borders of fields, very frequent throughout the whole kingdom. Autumn.

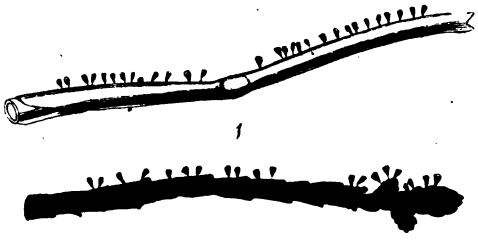
Plant 2–4 inches in height, and 2–3 in diameter, furnished at the base with a thick, mostly solid stipes, which divides immediately into a greater or less mass of branches, of a pale cinereous, blueish, purple-grey, or even purplish flesh-colour; divided upwards into smaller ones, but in an irregular manner, unequal, rugose, smooth, the sides often producing small knobby processes. Above, the branches are unequal in their termination, often palmate, sometimes subdichotomous, mostly obtuse at the apex, and frequently incrassated, but sometimes acute. They are also occasionally somewhat compressed. *Sporules* contained in filiform cells, which occupy the whole surface, except the very short stipes.

Few plants vary more than the present one in the degree of division, the shades of colour, and character of the terminating branches. I have seen it assume different forms, resulting from situation, weather, and injury. In very moist spots, it sometimes does not exceed an inch in height, and forms a most dense mass of rounded knobby branches, so closely wedged together, as to present almost an even surface. In consequence of injury, it occasionally becomes proliferous, and throws out from the margin a number of filiform short branches, like a fringe, while the stipes is more than usually thickened. It is, I believe, the most polymorphous species known.

Clavaria cinerea is one of those species constantly eaten on the Continent, probably from its greater abundance, as the whole genus is edible. In common with *Cl. coralloides*, it is called in France *barbe de bouc, bonquinbarde, gantelines, gallinoles, fripettes, chevelines, pied de coq, poule, mousse, barbes, menottes, espignettes, diables*, &c. &c. In Italy, they are called *ditola gialla, ditola rossa*, and *ditola bianca*, according to the colour of the varieties. They are stewed for the table, according to PERSOON, with butter, pepper and salt, ham and parsley, for an hour; and then put into a gravy sauce, or a fricassee of fowls.

In many parts of the country it is abundant.

Fig. 1. *A section of the stipes.* Fig. 2. *Sporuliferous cells.* Fig. 3. *Sporules.*



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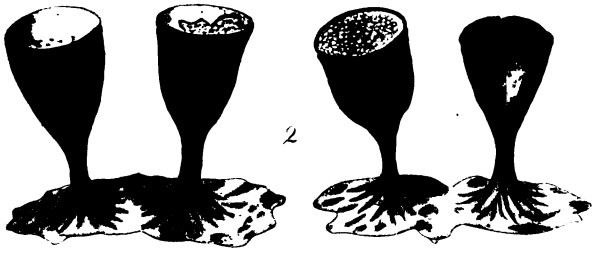

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CRATERIUM LEUCOCEPHALUM.

White-headed Craterium.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *GASTROMYCI, Link, Grev.*

GENERIC CHARACTER.

Peridium oblongum, stipitatum, operculatum, intus massa cellulosa, sporulifera, floccosa instructum.

Peridium oblong, stipitate, operculate, containing a cellulose, filamentous sporuliferous mass.

SPECIFIC CHARACTER.

CRATERIUM leucocephalum; *gregarium; peridio cyathiformi, rufescente, operculo tenuissimo, evanescente; floccis sporulisque albidis; stipite concolore.*

C. gregarious; peridium cyathiform, reddish, the lid very thin and evanescent; filaments and sporules whitish; stipes similar in colour to the peridium.

CRATERIUM leucocephalum, *Ditm. in Sturm's Deutschl. Fl.* (Fung.) t. 11.—*Gray's Nat. Arr.* v. 1. p. 579.

ARCYRIA leucocephala, *Hoffm. Fl. Germ.* 2. t. 6. f. 1.—*Pers. Syn. Fung.* p. 183.—*Alb. et Schwein. Conspect. Fung.* p. 100.—*Hook. Fl. Scot.* 2. p. 13.

STEMONITIS leucocephala, *Gmel. Syst. Nat. Linn.* 2. p. 1467.

CYATHUS cinereus, *Purt. Midl. Fl.* v. 3. p. 309. t. 35.

TRICHIA cinerea, *Trent. in Roth, Cal. Bot.* 1. p. 227.

HAB. On dead leaves, sticks, straws, &c. in moist woods, not unfrequent. October to February. Woods at Foxhall, Messrs WAUCH and GREVILLE. Pentland Hills. Woods at Balmuto.—In England, I believe it has only been found by Mr PURTON in Oversley and Ragley woods.

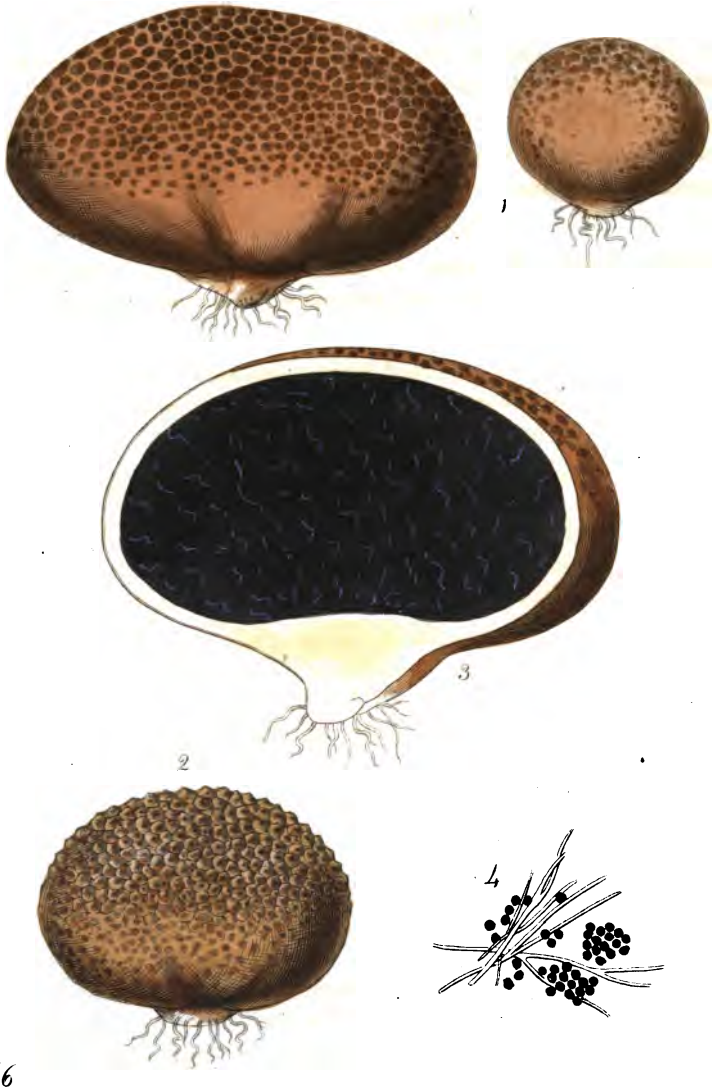
Gregarious, minute, stipitate, cyathiform, reddish-brown, about 1 line high. *Stipes* of the same colour as the peridium, dilated below, and passing into a thin subjacent membrane. *Peridium* thin and rather fragile. *Operculum* very delicate and fugacious. Interior filled with a cellulose dry mass of whitish filaments and sporules. *Filaments* forming a number of little woolly tufts.

This little plant will probably not prove rare in Great Britain, when mycology shall be more studied. Where it occurs,

it is usually in great profusion, and when growing on small sticks and straws, it is often so plentiful as to form a fringe for several inches. Mr PURTON seems to have been its discoverer in this country.

In the very fugacious lid, this species differs from the rest of the genus, in which it is more persistent, but nevertheless perfect.

Fig. 1. *Plants, nat. size.* Fig. 2. *Plants, magnified.* Fig. 3. *Sporules and filaments.*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SCLERODERMA Cepa.

Onion-like false Puff-ball.

Class and Order CRYPTOGAMIA FUNGI, *Linn.*—Nat. Ord. *GASTROMYCI, Link. Grev.*

GENERIC CHARACTER.

Plantæ globosæ sæpe stipitatæ. Peridium simplex, durum, epidermide verrucosa. Sphærulæ in glomerulos coacervatæ, floccis inspersæ.

Globose plants, often furnished with a stem. Peridium simple, hard, with a warty epidermis. Sporules collected into little roundish masses, and intermixed with small woolly filaments.

SPECIFIC CHARACTER.

Scleroderma Cepa; *subrotundum, depressum, epidermide nunc læviuscula, nunc reticulato-verrucosa vel muricata, flavo-fusca, stipite nullo sed basi mamillosa, subarhizo.*

S. roundish, depressed, the epidermis either nearly smooth, or reticulated by cracking into warts, or muricated, yellowish-brown; stipes none, but the base mammillose, root only a few fibres.

Scleroderma Cepa, *Pers. Syn. Fung.* p. 155.—*Schwein. Fung. Carol. Sup.* No. 348.—*Grev. Fl. Edin. ined.*

Scleroderma cepoides, *Gray's Nat. Arr.* v. 1. p. 582.

Tuber solidum, *With. Bot. Arr.* ed. 6. v. 4. p. 443.

Lycoperdon cæpæ-facie, *Vaill. Bot. Par.* p. 123. t. 16. f. 5, 6. *fide Pers.*

Hab. Woods and bushy places, in the autumn, not unfrequent. Woods at Fochabers. At Kinordy, the property of Charles Lyell, Esq. Abercorn woods at Duddingston, near Edinburgh.—In England, it has, I believe, only been found by Withering at Edgebaston, near Birmingham.

Plant mostly gregarious, of a roundish, but somewhat depressed form, one and a half to two inches in diameter, very solid and firm, never bursting at the apex or elsewhere. *Peridium* single (unless the epidermis be considered as a distinct covering), thick, of a white substance within, but yellowish or brownish without, varying much in the degree of wartiness, which is sometimes scarcely perceptible, but at others the surface is quite muricated with projecting processes. *Beneath*, the plant is generally slightly plicate, and has an obtuse production, but nothing like a stipes in the specimens I have seen. *Root* a few fibres, sometimes scarcely any. *Interior* of the plant whitish when young, but at length deep blue-black, and of a very dense substance. *Sporules* globose, collected in small gra-

nules, which are imbedded in a few cottony filaments. When *broken*, the inside has a dark grey colour, but when *cut*, it is black, the granules of clustered sporules being then divided.

SCLERODERMA *Cepa* is a plant, which, though described by VAILLANT, has scarcely found its way into any subsequent *Flora*. No modern figure of it has been published, and, except WITHERING and GRAY, I am not aware of any British botanist having noticed it. Nevertheless it is by no means rare; and now that the genus *Scleroderma* has been introduced into this country, many of the difficulties attending the whole group of the old Lycoperdons will be removed. It is much to be regretted that WITHERING's Botanical Arrangement, which first contained a system of British fungi, should have been so long stationary, as now rather to mislead than direct the student.

Fig. 1. *Scleroderma Cepa, nat. size.* Fig. 2. *A specimen with a muricated surface.* Fig. 3. *A section.* Fig. 4. *Sporules and filaments, magnified.*

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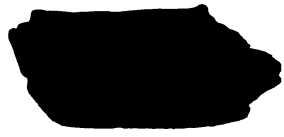

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CRYPTOSPHÆRIA PULCHELLA.

Elegant Cryptosphæria.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *HYPOXYLA, De Cand. Grev.*

GENERIC CHARACTER.

Receptaculum 0. *Sphærulæ duriusculæ, sparsæ vel aggregatæ, sub epidermide insidentes, ore nunc depresso nunc elongato, quandoque nullo; intus massa gelatinosa sporulifera instructæ.*

Receptacle 0. Spherules corneous, scattered or aggregate, lying beneath the epidermis, with the mouth depressed, elongated or wanting, containing a gelatinous sporuliferous mass.

SPECIFIC CHARACTER.

CRYPTOSPHÆRIA pulchella; *sphærulæ aggregatæ, circinnatæ, ore filiformi, longissimo, flexuoso, depresso; thecis utrinque attenuatis, sporulis ovalibus.*

C. spherules aggregated, forming a circle, mouth filiform, very long, flexuose, depressed; thecæ attenuated at each extremity, the sporules oval.

CRYPTOSPHÆRIA pulchella, *Grev. Fl. Edin. ined.*

SPHÆRIA pulchella, *Pers. Tent. Disp. Meth. Fung.* p. 3.—*Syn. Fung.* p. 43.—*Alb. et Schwein. Conspect. Fung.* p. 22.—*De Cand. Fl. Franç.* v. 6. p. 127.—*Moug. et Nestl. Pl. Crypt. Exsicc.* No. 279.

CIRCINOSTOMA pulchellum, *Gray's Nat. Arr.* v. 1. p. 521.

HAB. On the dead trunks and branches of *Prunus Cerasus* and *Betula alba* (the Cherry and the common Birch), at all seasons. Carlowrie, near Edinburgh. Abundant about Aviemore, and elsewhere in the Highlands of Scotland, on fallen birch-trees.

Spherules smooth, black, round, minute, somewhat shining, crowded together in a circular manner, with very long, slender, flexuose, converging mouths. The spherules are sometimes collapsed, but that is the result of drying. They form circles of different sizes, from one-eighth of an inch to half an inch in diameter; the smaller ones consisting of few, the larger ones of numerous spherules; and the larger the circle, the longer also are the mouths, which converge and meet in the centre. Taken separately, each spherule with its mouth bears a near resemblance to a retort in miniature. *Thecæ* or sporuliferous cells numerous, acutely attenuated at each extremity, each containing 3–4 oval sporules.

Among the thousand beautiful forms, structures and arrangements which lie concealed from unobserving eyes, and, on account of their minuteness, from all but the Cryptogamic Botanist, the present individual possesses a no mean rank. So completely is it protected by the outer bark, that to accident probably it owed its first detection. On the decaying birch-trees of the Scottish Highlands, it is however plentifully produced, and readily found by removing the white outer bark; sometimes it may be traced by a slight fissure on the surface, but a little practice enables the cryptogamist to fix, with tolerable certainty, on the trunks or branches which produce it.

Fig. 1. *Cryptosphæria pulchella, nat. size.* Fig. 2. *Ditto, magnified.* Fig. 3. *Separate spherules.* Fig. 4. *Thecæ and sporules.*

MORCHELLA ESCULENTA.

Round-headed Morell.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *FUNGI, Link, Grev.*

GENERIC CHARACTER.

Pileus stipitatus, lacunosus, undique hymenio tectus, cum stipite confluens.

Pileus stipitate, lacunose, confluent with the stem, the surface wholly occupied by the hymenium.

SPECIFIC CHARACTER.

MORCHELLA esculenta; *pileus ovato-rotundatus, basi adnatus, areolis profundis; stipite lævi albido.*

M. pileus ovate-roundish, adnate at the base, the areolæ deep; stipes smooth, white.

MORCHELLA esculenta, *Pers. Syn. Fung.* p. 618. et *Mycol. Europ.* v. 1. p. 206. —*De Cand. Fl. Franç.* ed. 3. v. 2. p. 213.—*Ejusd. Syn.* p. 43.—*Tratt, Essb. Schw.* p. 168. t. EE.—*Alb. et Schwein.* p. 300.?—*Schwein. Fung. Carol. Sup.* No. 1125.—*Gray's Nat. Arr.* v. 1. p. 661.—*Hook. Fl. Scot.* 2. p. 31. —*Grev. Escul. Fung. in Wern. Trans.* v. 4. No. 24.—*Fl. Edin. ined.*

HELVELLA esculenta, *Sow. Fung.* t. 51. *fig. sinist.*—*Purt. Midl. Fl.* v. 2. p. 679. *(non alior. auct.)*

PHALLUS esculentus, *Linn. Fl. Succ.* 1262.—*Sp. Pl.* 1648.—*Schæff. Fung.* t. 199. 298, 299, 300.—*Huds. Fl. Angl.* 2. p. 629.—*Bull. Champ.* p. 273. t. 218.—*Bolt. Fung.* t. 91.—*Poll. Pall.* 3. p. 304.—*With. Bot. Arr.* ed. 6. v. 4. p. 428.—*Lightf. Fl. Scot.* v. 2. p. 1043.—*Relh. Fl. Cantab.* ed. 3. p. 561.

HELVELLA Phalloides, *Afz. Obs.* p. 5. *fide Fries.*

BOLETUS esculentus, rugosus, amplior et orbicularis, *Mich. Gen. Nov. Pl.* p. 203. t. 85. f. 1.—*Tourn. Inst.* p. 561.

BOLETUS esculentus, rugosus, albicans, quasi fuligine infectus, *Mich.* l. c. p. 203. t. 85. f. 2.—*Tourn. Inst.* p. 561. t. 329. f. A.

BOLETUS esculentus, rugosus, fulvus, *Batt.* p. 24. t. 2. f. F.

FUNGUS rugosus vel cavernosus, sive MERULIUS niger et albus, *J. Bauh. Hist. Pl.* v. 3. p. 836.

FUNGI præcoces, *Dodon. Stirp. Hist.* p. 481.

FUNGUS spongiosus Dalechampii, *Dalechamp, Hist. Pl.* v. 2. p. 1587.

FUNGUS faviginosus, *Lobel. Ic.* 2. p. 271.—*Gerarde's Herb.* p. 1583.—*Park. Theat. Bot.* p. 1317.—*Raii, Syn.* p. 11. No. 7.

HAB. In woods and bushy places, chiefly in a sandy soil. In Spring. Blair in Athol. Woods at Langholm in Eskdale. Lugton wood, near Dalkeith, LIGHFOOT. Banks of the river Almond at Foxhall, Captain WAUCH. —In England, it is tolerably frequent throughout the country.

Plant 2–5 inches high, with an agreeable taste, but slight smell. *Pileus* from the size of a pigeon's egg to that of a swan's egg, hollow, usually ovate, rounded; but it is liable to vary in its form even to monstrosity. *Colour* from a pale yellowish-brown, to olivaceous, and smoke-grey. *Surface* deeply pitted, or formed in irregular areolæ, divided by anastomosing ribs. *Stipes* 1–3 inches long, ½ to 1 inch thick, white, hollow, confluent with the contracted base of the pileus, and the interior having a free communication with that of the pileus. *Hymenium* covering the whole pileus. *Thecæ* or *sporuliferous cells* fixed, containing about 8 globular sporules, which escape and render the surface of the pileus sometimes farinaceous.

It is difficult, nay impossible, to ascertain how many species of Morelle were included by the old botanists under the name of *esculentus;* and this has made me hesitate to quote several authorities which might have been added to the catalogue of synonyms. SOWERBY's right-hand figure, I suspect, belongs to our plant, and FRIES has indeed cited it. PERSOON, on the other hand, is, like myself, not quite convinced of its identity.

The Morelle is among those fungi which were first used as regular articles of food, being much praised even before the time of CLUSIUS. CAMERARIUS says they first received the name of *Morchell* from the Germans. In other parts of the Continent, they are called *Morille, morchelen, spagniole, spongignole, spongiola, pungola, spugnino, spugnola buono,* and *tripetto.*

The ways of dressing them for the table are various and well known. They mostly enter into ragouts, but are sometimes served by themselves. On the Continent, they are frequently stuffed.

The country people in Germany first made the observation that Morelles grew most plentifully where fires had been made, and, in their endeavours to cultivate them by this strange method, the woods frequently fell a sacrifice, until the practice was interdicted by law.

Fig. 1. *Morchella esculenta, nat size.* Fig. 2. *A section.* Fig. 3. *Thecæ and sporules, magnified.*

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CRYPTOSPHÆRIA CAPILLATA.

Hair-tufted Cryptosphæria.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *HYPOXYLA*, *De Cand. Grev.*

GENERIC CHARACTER.

Receptaculum 0. *Sphærulæ duriusculæ, sparsæ vel aggregatæ, sub epidermide insidentes, ore nunc depresso nunc elongato, quandoque nullo; intùs massa gelatinosa sporulifera instructæ.*

Receptacle 0. Spherules corneous, scattered or aggregate, lying beneath the epidermis, with the mouth depressed, elongated or wanting, containing a gelatinous sporuliferous mass.

SPECIFIC CHARACTER.

CRYPTOSPHÆRIA capillata; *in foliis graminum mortuorum parasitica; sparsa, fusca, intus alba, hemisphærico-depressa, apice capillis nigris, rigidis, divergentibus instructa.*

C. parasitic on the leaves of dead grasses; scattered, brown, white within, flatly hemispherical, the apex furnished with black rigid diverging hairs.

CRYPTOSPHÆRIA capillata, *Grev. Fl. Edin. ined.*
SPHÆRIA capillata, *Nees von Esenbeck, Syst.* p. 82. t. 43. f. 846.

HAB. On the decayed leaves of grasses. Auchindenny woods. Braemar. In both situations on the leaves of *Holcus mollis.*

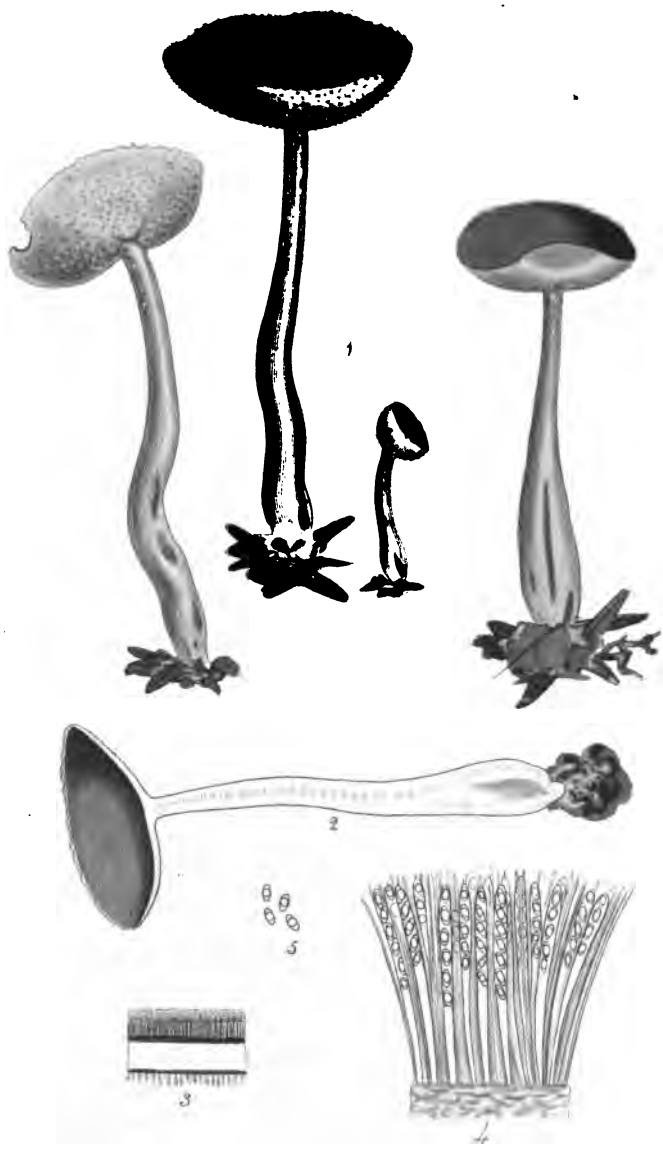
Gregarious, sometimes scattered over the leaves of a whole plant, minute, but the little terminal tufts of black bristly hairs very evident to the naked eye. It is convex, dark brown, and situated beneath the epidermis, or rather contained in the very substance of the leaf, the apex alone protruding its tuft of hairs. The interior is quite white. I have not been able to discover the sporules; they are, however, figured by NEES VON ESENBECK, and appear to be oblong, and divided into 3 parts by articulations.

This minute, but fine little *Cryptosphæria*, is only described by the celebrated NEES VON ESENBECK in his System of Fungi; for, although he quotes the *Sphæria comata* of PERSOON (Syn. Fung. p. 88.), that plant is in reality a very

different species, as any one may convince themselves, by consulting the figure and description given by TODE in his *Fungi Mecklenburgenses Selecti*, (Fasc. 2. p. 15. t. 10. f. 81.)

In Braemar, Dr HOOKER, Mr WALKER ARNOTT and myself, found it in the greatest abundance. At present, it is a species but little known.

Fig. 1. *Plants of Cryptosphæria capillata, nat. size.* Fig. 2. *Ditto, magnified.* Fig. 3. *A section of a spherule.* Fig. 4. *The appearance of a thin slice under the microscope.*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PEZIZA Macropus.

Large-stemmed Peziza.

Class and Order CRYPTOGAMIA FUNGI, *Linn.*—Nat. Ord. *FUNGI, Link, Grev.*

GENERIC CHARACTER.

Pileus stipitatus aut sessilis, plus minusve cupuliformis vel complanatus, cellulis elongatis sporuliferis, in pagine superiore.

Pileus sessile or stipitate; dilated upwards into a variable cup-shaped or flattish receptacle, having sporules contained in elongated cells, whose summits terminate on the superior surface.

SPECIFIC CHARACTER.

Peziza Macropus; *subgregaria, magna, pileo hemisphærico, hirto-verrucoso, cinereo, disco murino expallente; stipite longissimo, deorsum incrassato.*

P. subgregarious, large, the pileus hemispherical, slightly hairy and verrucose, ash-coloured, the hymenium mouse-coloured, at length pale; stipes very long, incrassated below.

Peziza Macropus, *Pers. Obs. Mycol.* 1. p. 26. t. 1. f. 2. & 3.—*Syn. Fung.* p. 645.—*Mycol. Europ.* v. 1. p. 236.—*Alb. et Schwein. Conspect. Fung.* p. 313.—*Fl. Dan.* t. 1200. f. 2.—*Schwein. Fung. Carol. Sup.* No. 1177.—*Fries, Syst. Fung.* v. 2. p. 57.—*Grev. Fl. Edin. ined.*

Peziza stipitata, *Huds. Fl. Angl.* v. 2. p. 636.—*Bull. Champ.* p. 271. t. 457. f. 2. t. & t. 196.—*With. Bot. Arr.* ed. 6. v. 4. p. 414.—*Sow. Fung.* t. 38.? *Willd. Fl. Berol.* p. 401.—*De Cand. Fl. Franç.* ed. 3. v. 2. p. 85.—*Ejusd. Syn.* p. 18.

Peziza sublicia, *Holmsk. Fung. Dan.* v. 2. p. 26. t. 10.

Helvella sublicia, *Holmsk. Fung. Dan.* v. 2. p. 51. t. 27.

Helvella hispida, *Bolt. Fung.* v. 2. t. 97. (*H. hemisphærica is the name on the plate.*)—*Schæff. Fung.* t. 167.

Helvella fuliginosa, *var.* 2. *campanulata, Purt. Midl. Fl.* v. 3. p. 257.

Octospora villosa, *Hedw. Desc. Musc. Frond.* v. 2. p. 54. t. 19. f. B.

Macroscyphus macropus, *Gray's Nat. Arr.* v. 1. p. 672.

Peziza terrea petiolo longo gracili, acetabulo extus subaspero, plano aut concavo, *Hall. Hist.* 2227.

Fungus cyathiformis, major et elatior, &c. *Raii, Hist.* v. 3. p. 20.

Fungoides fuscum, pediculo longiore donatum, *Buxb. Comm. Act. Petrop.* 4. p. 282. t. 29. f. 3.

Hab. Moist woods. In the Autumn. Balmuto.—In England, the stations are, near Guilford, Hudson; Finchley Common, Sowerby; woods below Highfield, near Halifax, Bolton; on the road to Dunnington from Pophills, Purton.

Plant scattered, but somewhat gregarious, delighting in moist shady places, and a sandy soil. *Root* a small mass of fibres adhering tenaciously to the soil. *Stipes* 1–3 inches high, attenuated upwards, smooth or slightly hairy, even or somewhat lacunose, cylindrical, solid or nearly so, very white within, rather firm. *Pileus* hemispherical, sometimes becoming plane, half an inch to an inch and a half broad, thin for its size, of a rather dense substance, but fleshy and brittle, the colour of the hymenium dark or light grey, or brownish, becoming pale in age; that of the exterior very pale or whitish, tinged with brown. The surface of the hymenium is smooth, that of the exterior somewhat verrucose and villose; in some varieties even hairy. *Sporules* elliptical, 2-celled, 5–8, in long filiform tubes.

This is by no means a frequent plant, but is tolerably well marked, and constant to its characters. DE CANDOLLE, however, has erred in quoting *Boletus calyciformis* of BATTARRA, whose figures belong to *Peziza acetabulum* of LINNÆUS. Mr GRAY has thrown it, along with some others, into a distinct genus; but the generic character to be derived from different groups of *Peziza*, is so vague, when exposed to the test of practical knowledge, that more confusion than simplification would arise from such a division. Compare, as an illustration, Mr GRAY's two genera of *Macroscyphus* and *Hymenoscyphus*:—

Macroscyphus. Thallus cup-like, soft, cellular, rather fibrous; surface scaly, or slightly bristly; sporidia with 6 or 8 sporæ in each, in a single row.

Hymenoscyphus. Thallus cup-like, thin, fibrous, cellular, bald, sporidia club-shaped, with 8 sporæ in two rows.

Here the want of scales or slight bristles, and the sporules being in 1 or 2 rows, constitute the whole generic difference; which is rendered null by the fact, that the number and arrangement of the sporules is often irregular in the same species. Similar objections may be mode to Mr GRAY's genera *Scodellina*, *Calycina*, and *Dasyscyphus*, which may indeed be said to have no character at all distinct from *Peziza*.

It ought to be observed, that the above-named author has cited BOLTON's figure of our plant under the name of P. *macropus*, instead of *Helvella hispida*; and also, that BOLTON himself has the name of *Helvella hemisphærica* engraved on the plate, but that of *hispida* in the text.

Fig. 1. *Peziza macropus, in different states, nat. size.* Fig. 2. *Section of a plant.* Fig. 3. *Portion of a section of a pileus magnified.* Figs. 4. & 5. *Thecæ and sporules.*

HYDNUM IMBRICATUM.

Scaly Hydnum.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *FUNGI, Link, Grev.*

GENERIC CHARACTER.

Hymenium aculeatum. Aculei vel processi subulati, liberi, carnosi, sporuliferi.

Hymenium spinose. Spines or awl-shaped processes free, carnose, sporuliferous.

SPECIFIC CHARACTER.

HYDNUM imbricatum; *pileo carnoso, plano, tessulato-squamoso, azono, umbrino, aculeis albido-cinereis; stipite brevi,* (Fries).

H. pileus fleshy, plane, tessulato-squamose, zoneless, brown, the spines greyish-white; stem short.

HYDNUM imbricatum, *Linn. Fl. Suec.* 1257.—*Sp. Pl.* 1647.—*Schæff. Fung.* t. 140.—*Fl. Dan.* t. 176.?—*Sow. Fung.* t. 73.—*Pers. Syn. Fung.* p. 554.—*Alb. et Schwein.* p. 264.—*Fries, Obs. Mycol.* 1. p. 137.—*Syst. Mycol.* v. 1. p. 398.—*With. Bot. Arr.* ed. 6. v. 4. p. 403.—*Gray's Nat. Arr.* v. 1. p. 650.—*Tratt. Esbarr. Schwaem.* t. 10.

HYDNUM cervinum, *Pers. Obs. Mycol.* 1. p. 74.—*De Cand. Fl. Franç.* ed. 3. v. 6. p. 38.

HYDNUM squarrosum, *Nees ab Esenb. Syst.* t. 32. f. 240.

HAB. Fir woods in the autumn, not frequent. Glen More, Messrs HOOKER and GREVILLE.—In England, it seems to be equally rare, having been found only in Bedfordshire by Mr ABBOT, and near Maidstone and Bungay by Mr WOODWARD.

Pileus 2–5 inches broad, thick and fleshy, plane or slightly convex, and rounded at the margin, at length somewhat hollowed in the centre, pretty regular in form, varying in color from reddish to a kind of mouse-brown, scaly; scales imbricated, numerous, the central ones being often mere cracked portions of the pileus, which renders that part tessellated. *Flesh* pale buffish or reddish. *Hymenium* composed of numerous, very short, obtuse, greyish-white, entire spines, of nearly equal length. *Stipes* central, 1–2 inches long, often above 1 inch thick, firm, irregular, whitish.

This species of *Hydnum* is by no means frequent: indeed, the specimens figured, are the only ones I ever saw, and were drawn on the spot. No plant can be better characterised than is the present one, by its scaly pileus and short thick stem: it is sufficient to have once seen a plate of it in order to recognise it.

This, as well as all the other species of the genus, is edible, and used on the Continent as food. Vid. Pl. 44. of this work.

Fig. 1. *Hydnum imbricatum, nat. size.* Fig. 2. *A section.* Fig. 3. *Spines of the hymenium magnified.*

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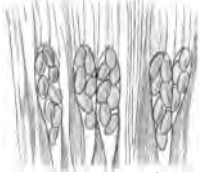

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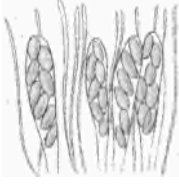

HYSTERIUM Fraxini.

Ash-branch Hysterium.

Class and Order CRYPTOGAMIA FUNGI, *Linn.*—Nat. Ord. *HYPOXYLA, De Cand. Grev.*

GENERIC CHARACTER.

Crusta nulla. Peridium oblongum, rima longitudinali dehiscens. Thecæ elongatæ, erectæ, filamentis gelatinosis immixtæ.

Crust none. Peridium oblong, bursting by a longitudinal slit. Thecæ elongate, erect, mixed with gelatinous filaments.

SPECIFIC CHARACTER.

Hysterium Fraxini; *convexum, tumidum, oblongo-ellipticum, nigerrimum, modo subconcentrico dispositum, sporulis magnis flavis.*

H. convex, tumid, oblong-elliptical, very black, disposed in a subconcentric manner; sporules large, yellow.

Hysterium Fraxini, *Pers. Disp. Meth. Fung.* p. 5.—*Syn. Fung.* p. 100.—*Alb. et Schwein. Consp. Fung.* p. 55.—*Schwein. Fung. Carol. Sup.* No. 244.—*Moug. et Nestl. Pl. Exsicc.* No. 267.—*Purt. Mid. Fl.* v. 3. p. 319. t. 32.—*Hook. Fl. Scot.* 2. p. 8.—*Grev. Fl. Edin. ined.*

Hypoderma Fraxini, *De Cand. Fl. Franç.* ed. 3. v. 6. p. 167.—*Syn.* p. 64.—*Gray's Nat. Arr.* v. 1. p. 509.

Sphæria sulcata, *Bolton, Fung.* t. 124.—*Sow. Fung.* t. 315.—*With. Bot. Arr.* ed. 6. v. 4. p. 469.

Hab. On the smaller branches of the Ash tree *(Fraxinus excelsior)* in autumn and spring, very common.

Plants varying in shape, but mostly obtusely elliptical, bursting through the bark, tumid and projecting, corneous, very black, scattered or irregularly arranged in a concentrical manner, quickly causing the bark to decay from that portion of the branch on which they are produced, when they appear as if growing on the naked wood. *Thecæ* club-shaped, very obtuse, containing 6–8 oval large yellow sporules.

One of the best known and most common of the genus. It was first described by Bolton, who, taking it at first sight for a *Sphæria*, was bound to make it agree with the character

of that genus: he accordingly discovered (by means of the *oculus internus*) that it contained spherules, of which he has given two dissections! SOWERBY relied on BOLTON's accuracy, and, without any dissection of the internal structure at all, continued it in the same genus. What apology the Editor of the last edition of WITHERING's Botanical Arrangement has to offer for exhibiting the same degree of inattention, it is impossible to conceive. The very genus *Hysterium* is not in the work even as a synonym.

Dr HOOKER, in his *Flora Scotica*, and soon afterwards Mr PURTON in his *Midland Flora*, introduced it to this country as an *Hysterium*.

Fig. 1. *Hysterium Fraxini, nat. size.* Figs. 2. *Single plants, magnified.* Fig. 3. *A transverse section.* Fig. 4. *Thecæ and sporules.*

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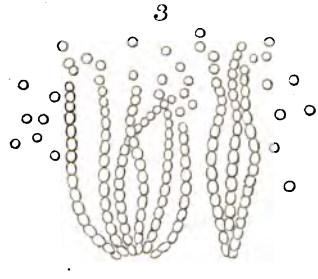
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ACROSPORIUM MONILIOIDES.

Necklace Acrosporium.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *BYSSOIDEÆ, Grev.*—MUCEDINES, *Link.*

GENERIC CHARACTER.

Filamenta simplicia, cæspitosa, moniliformia, articulis (sporulis?) secedentibus.

Filaments simple, tufted, moniliform, the joints (sporules?) separating and deciduous.

SPECIFIC CHARACTER.

ACROSPORIUM monilioides; *candidum cæspitoso-effusum, in foliis graminum parasiticum.*

A. white, in spreading tufts, on the leaves of grasses.

ACROSPORIUM monilioides, *Nees, Syst.* 2. p. 14. t. 4. f. 49.—*Pers. Mycol. Europ.* v. 1. p. 23.—*Gray's Nat. Arr.* v. 1. p. 552.—*Grev. Fl. Edin. ined.*

MONILIA hyalina, *Fries, Obs. Mycol.* 1. p. 210. t. 3. f. 4. *fide Persoon.*

BOTRYTIS simplex, *ββ*, monilis, *Albert et Schw. Conspect. Fung.* p. 363.

HAB. On the living leaves and culms of various grasses, especially *Holcus mollis*, in spring and summer, frequent.

The whole plant or aggregation of plants, form little effused tufts of 1–2 eighths of an inch long, of an oblong or elliptical form. Each of these tufts is composed of a number of simple pellucid *filaments*, jointed like a necklace, and attenuated towards the base. No one has been able to detect any distinct *sporules*, but the uppermost joints seem to supply their place, as they separate spontaneously. The *colour* varies from snow-white to greyish.

To this genus PERSOON has, in his *Mycologia Europæa*, united two others, *Oidium* and *Alysidium* of KUNZE and SCHMIDT, Mykol. Hefte 1. p. 11. The latter one is in reality precisely the same, but the former certainly differs somewhat in general habit; and yet I am inclined to follow PERSOON in uniting the whole. *Oidium* is illustrated both in the system

of NEES ab ESENBECK, t. 3. f. 44., and in the excellent work above quoted of KUNZE and SCHMIDT, t. 2. f. 22.

Fig. 1. *Tufts of Acrosporium monilioides, nat. size.* Fig. 2. *Ditto, magnified.* Fig. 3. *Filaments and sporules.*

AGARICUS PSITTACINUS.

Green and Yellow Agaric.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *FUNGI, Link, Grev.*

DIV. LEUCOSPORUS, *Fries.*—SECT. III. GYMNOPUS, *Pers.*

GENERIC CHARACTER.

Pileus stipitatus aut latere affixus, subtus lamellis sporuliferis, rectis, simplicibus. Volva nulla.

Pileus furnished with a stem or fixed by its side, bearing on the inferior surface, straight, simple lamellæ (gills) containing sporules. Volva (wrapper) none.

SPECIFIC CHARACTER.

AGARICUS psittacinus; *e viridi lutescens, viscidus; pileo campanulato, expanso, humido striato; lamellis adnatis subdistantibus; stipite æquali lævi,* (Fries).

Ag. green changing to yellow, viscid; pileus campanulate, spreading, striate when moist; lamellæ adnate, somewhat distant; stipes equal, smooth.

AGARICUS psittacinus, *Schæff. Fung.* t. 301.—*Sow. Fung.* t. 82.—*Pers. Syn. Fung.* p. 335.—*Alb. et Schwein.* p. 172.—*With. Bot. Arr.* ed. 6. v. 4. p. 323.—*Rehl. Fl. Cantab.* ed. 3. p. 535.—*Purt. Midl. Fl.* v. 2. p. 644. et v. 3. p. 415.—*Schwein. Fung. Carol. Sup.* No. 636.—*Grev. Fl. Edin. ined.*

AGARICUS cameleon, *Bull. Champ.* p. 562. t. 545. f. 1.—*De Cand. Fl. Franç.* ed. 3. v. 2. p. 181.—*Syn.* p. 36.

HYDROPHORUS psittacoides, *Batt. Fung. Arim.* p. 52. t. 21. f. E.

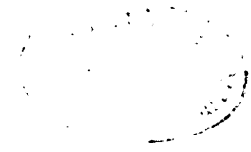
FUNGUS parvus, totus viridis, &c. *Mich. Gen. Nov.* p. 150.

HAB. Pastures in the autumn very frequent.

Whole *Plant* green at first, at length almost entirely yellow, except the summit of the stipes, which frequently remains green to the last. *Pileus* about 1 inch in breadth, conical, becoming somewhat plane and umbonate, or, at least, spreading at the margin, smooth, glutinous, striated when moist, the edge subentire, often cracking. *Flesh* thin, yellowish. *Lamellæ* rather thick and somewhat distant, slightly attached to the stipes, broadest in the centre, bright yellow, frequently shaded with green. *Stipes* hollow, splitting, very viscid, 2–3 inches high, about 2 lines thick, sometimes compressed, mostly crooked at the base, green above, yellow below. The colour of the whole plant varies greatly in intensity.

This very beautiful Agaric is readily distinguished by its bright colours, which have gained it the appropriate name of *psittacinus*. It bears the nearest affinity to Ag. *conicus* (Ag. *aurantius*, Sow. t. 381.), from which, indeed, it is difficult to separate it by a written character. The strongest difference resides in the green colour, which is fortunately very constant. It may be added, that the lamellæ are crowded in Ag. *conicus*, and not adnate with the stipes; that the pileus, when young, forms a much higher cone, and that the margin is very irregular, being frequently even lobed. The group to which the present species belongs, is stated by FRIES to possess mild properties, but not to be used as food.

Fig. 1. *A section of a plant.* Fig. 2. *Sporules, magnified.—All the other figures represent different states and forms of the plant, the nat. size.*



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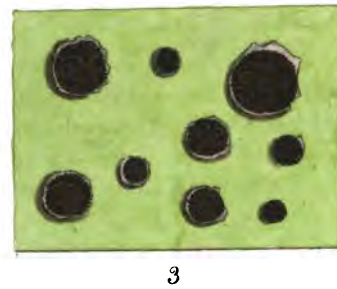
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PUCCINIA VARIABILIS.

Variable Puccinia.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *GASTROMYCI, Grev.*—EPIPHYTÆ, *Link.*

GENERIC CHARACTER.

Peridium verum 0. *Sporidia uni aut multiloculata, pedicellata, pedicello fixa, et in cæspitulis aggregata, foliis vivis parasiticis. Epidermis foliorum peridio simillima.*

True peridium 0. Sporidia one or many-celled, pedicellated, fixed by the pedicel, and growing in minute clusters or tufts on living leaves. The epidermis bearing a strong resemblance to a peridium.

SPECIFIC CHARACTER.

PUCCINIA variabilis; *hypo- et epiphylla, minuta, subnigra, orbicularis; sporidiis plerumque obovatis, valde obtusis, biloculatis, loculis sæpius subdivisis et constrictis; pedicello brevissimo.*

P. on both sides of the leaf, minute, nearly black, orbicular; sporidia mostly obovate, very obtuse, two-celled, the cells often subdivided and constricted; pedicel very short.

PUCCINIA variabilis, *Grev. Fl. Edin. ined.*

HAB. On the leaves of the Dandelion *(Leontodon Taraxacum)*, in the autumn, rather rare. About Edinburgh.

Plants minute, orbicular, scattered, never confluent, very unequal in size, bordered by the remains of the ruptured epidermis, almost black. *Sporidia* very polymorphous, but having a general obovate form, the upper cell being always very obtuse, the lower one sometimes attenuated. Sometimes one or both the cells are subdivided, at others neither. *Pedicel* extremely short.

Not being able to find any described species possessing the characters of this little plant, I have ventured to give it a name expressive of the inconstant form of the *sporidia*. It may not

be rare, but I have seldom seen it, and only in this neighbourhood.

Fig. 1. *Puccinia variabilis on a portion of a leaf of Leontodon Taraxacum, nat. size.* Fig. 2. *Plants, magnified.* Fig. 3. *Sporidia, highly magnified.*

AGARICUS MICACEUS.

Spangled Watery Agaric.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *FUNGI, Link, Grev.*

DIV. COPRINUS, *Fries, Persoon.*

GENERIC CHARACTER.

Pileus stipitatus aut latere affixus, subtus lamellis sporiferis, rectis, simplicibus instructus. Volva nulla.

Pileus furnished with a stem or fixed by its side, bearing on the inferior surface, straight, simple, sporuliferous lamellæ. Volva none.

SPECIFIC CHARACTER.

AGARICUS micaceus; *cæspitosus, pileo membranceo, sulcato, furfuraceo, (plerumque aurantiaco-fuscescenti); lamellis e pallido nigrescentibus; stipite equali, fragili.*

Ag. tufted, the pileus membranaceous, furrowed, furfuraceous (mostly orange-brown); lamellæ pale, at length black; stipes equal, fragile.

AGARICUS micaceus, *Bull. Champ.* p. 415. t. 565. et 246.—*De Cand. Fl. Franç.* ed. 3. v. 2. p. 148.—*Ejusd. Syn.* p. 30.—*With. Bot. Arr.* ed. 6. v. 4. p. 342.—*Winch, Bot. Guide,* 2. p. 90.—*Fl. Dan.* t. 1193.—*Schum. Enum.* p. 357.—*Fries, Syst. Mycol.* v. 1. p. 309.—*Grev. Fl. Edin. ined.*

AGARICUS congregatus, *Sow. Fung.* t. 261.—*With. Bot. Arr.* ed. 6. v. 4. p. 341.—*Winch,* l. c. p. 90.—*Purt. Mid. Fl.* v. 3. p. 422.—*Hook. Fl. Scot.* 2. p. 23.

AGARICUS ferrugineus, *Pers. Syn. Fung.* p. 400.—*Alb. et Schwein. Conspect. Fung.* p. 199.—*Schwein. Syn. Fung. Carol.* No. 703.

AGARICUS lignorum, *Schæff.* t. 66.

AGARICUS truncorum, *Schæff.* t. 6.

AGARICUS extinctorius, *Bull. Champ.* t. 437. f. 1.

AGARICUS digitalis, *Batsch. Elench. Fung.* t. 1. f. 1.—*Fl. Dan.* t. 1371. *fide Fries.*

AGARICUS turbinatus, var. 1. *With.* l. c. p. 339.

AGARICUS striatus? *Bolt. Fung.* t. 54.

HYDROPHORUS oris laceris, *Batt. Fung.* p. 54. t. 26. figs. D.—F.

HYDROPHORUS oris laceris alter, *Batt.* l. c. t. 27. f. G, H.

HAB. On the stumps of fallen and decaying trees, at the foot of gate-posts, &c. very common. Spring and autumn.

Tufted. *Pileus* one inch to one inch and a half from the base to the apex, ovate-campanulate, furrowed and striate, smooth at the summit, furfura-

ceous below, the base somewhat truncate; the color varies from very pale to ferruginous, livid, ochraceous, and brown orange. When young it is sprinkled with shining particles, which disappear in old age. In decay, the margin turns up, becomes nearly plane, and dissolves into a black fluid. *Flesh* scarcely any. *Lamellæ* very numerous, free, at first whitish, but soon passing through a dull rose colour, grey, and brown to black. *Stipes* 2–6 inches high, rather slender, 2–3 lines thick, white, hollow, glabrous, very fragile, equal or slightly attenuated upwards.

The present species is one of a striking group, whose very singular property it is, to dissolve in decay, and almost entirely to disappear in an inky fluid. On this account, BATTARA bestowed upon it the expressive name of *Hydrophorus*. Another character common to this group, is black sporules, and lamellæ whitish when young, but at length changing to black. No use has hitherto been made of the fluid formed by these plants, that I am aware of.

The synonymes of several authors, whose works I do not possess, are given by BULLIARD; not having any other authority, I preferred rather to omit them, than incur the risk of propagating error. They are,

FUNGUS pileo plicastili major, *Buxb. Cent.* 2. t. 50. f. 1.
AGARICUS soboliferus, *Joahc. Pauli, Nom. Fung.* t. 3. f. 1. tom. 1.
AGARICUS farinosus, *Berg. Phyt.* t. 25.

In Mr GRAY's work, this species is altogether omitted, as well as several other described British *Agarici*.

The name *micaceus* is expressive of the effect of the shining particles on the young pileus, which appears as if spangled with minute particles of mica; and does not, as SOWERBY supposed, imply the pileus to be of a slate-colour.

Fig. 1. *A group of Ag. micaceus, nat. size, one plant of which is dissected in situ.* Fig. 2. *Sporules magnified.*

77.

SCLEROTIUM QUERCINUM.

Oak-leaf Sclerotium.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *GASTROMYCI? Link, Grev.*

GENERIC CHARACTER.

Massa subglobosa aut difformis, intus homogenea, vesiculosa, carnosa, vel cornea. (Sporulæ incognitæ).

A subglobose or shapeless mass, within homogeneous, vesiculose, fleshy or corneous within. (Sporules have not hitherto been discovered).

SPECIFIC CHARACTER.

SCLEROTIUM quercinum; *sparsum, globosum vel subhemisphæricum, læviusculum, pallidum, demum nigrescens, intus corneum.*

S. scattered, globose or subhemispherical, rather smooth, pale, at length black, corneous within.

SCLEROTIUM quercinum, *Pers. Disp.* p. 15.—*Ejusd. Syn. Fung.* p. 124. et *Icon. Pict.* fasc. 3. p. 42. t. 17. f. 2.—*Alb. et Schwein. Consp. Fung.* p. 76.—*Moug. et Nestl. Pl. Exsicc.* No. 575.—*Schwein. Syn. Fung. Carol. Sup.* No. 317. —*Gray's Nat. Arr.* v. 1. p. 591.—*Grev. Fl. Edin. ined.*

SCLEROTIUM pustula, *De Cand. Fl. Franç.* ed. 3. v. 6. p. 113.—*Ejusd. Mem. du Mus.* v. 2. No. 18.

HAB. On the dead leaves of both the British species of Oak. On the Continent, it has also occurred on those of the Chesnut and Hornbeam. In North America, M. SCHWEINIZ finds it on different species of Walnut. In no country is it very abundant. I have only seen it in Swanston wood, near Edinburgh, and in woods at Balmuto, Fifeshire. Spring to Autumn.

Plants much scattered, regular in form, roundish, but often depressed, either attached to the leaf by a small portion of the base, or wholly adnate, or even passing through and appearing on the other side of the leaf, as represented at Fig. 3. in the Plate. At first they are of a dirty white colour, but soon assume a darker hue, and at length become nearly black. The substance is very dense and corneous; the surface rather smooth, except under a high magnifying power, when it appears slightly granulated. Mature plants vary from 1 to 2 lines in diameter.

In this species, as well as in that already figured in this work, I have been unable to detect any thing like sporules. TODE and PERSOON conjectured that they resided within the plant. This is doubted by DE CANDOLLE and the accurate SCHWEINIZ, the former of whom observed the exterior surface of some species to be covered with a farinaceous substance, analogous, as he imagined, to that which is often seen on *Clavariæ*. The pulverulent surface of the *Clavariæ*, we know to result from the escape of true sporules, which are very obvious under a moderate magnifier. Nothing at all satisfactory, however, has arisen from microscopical examination of the *Sclerotia*, which may be truly affirmed to be as little understood as when TODE defined the genus.

Fig. 1. *Plants, nat. siz.* Fig. 2. *A plant magnified.* Fig. 3. *A section.* Fig. 4. *The appearance of a thin slice under a high power of the microscope.*

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CRYPTOSPHÆRIA AURANTIA.

Orange Cryptosphæria.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *HYPOXYLA, De Cand. Grev.*

GENERIC CHARACTER.

Receptaculum 0. *Sphærulæ duriusculæ, sparsæ vel aggregatæ, sub epidermide insidentes, ore nunc depresso nunc elongato, quandoque nullo; intus massa gelatinosa sporulifera instructæ.*

Receptacle 0. Spherules mostly corneous, scattered or aggregate, lying beneath the epidermis, with the mouth depressed, elongated or wanting, containing a gelatinous sporuliferous mass.

SPECIFIC CHARACTER.

CRYPTOSPHÆRIA aurantia; *conferta, sphærulis flavidis, subrotundis immersis, ore brevi, crasso, obtuso, exserto, tomento aurantio cincta.*

C. crowded, spherules roundish, yellowish, immersed, with a short, thick, obtuse, exserted mouth, surrounded by an orange web.

CRYPTOSPHÆRIA aurantia, *Grev. Fl. Edin. ined.*

SPHÆRIA aurantia, *Pers. Icon. et Desc. Fung.* fasc. 2. t. 11. f. 4,-5.—*Ejusd. Syn. Fung.* p. 68.—*Alb. et Schw. Conspect. Fung.* p. 35.—*Schwein. Syn. Fung. Carol. Sup.* No. 170.

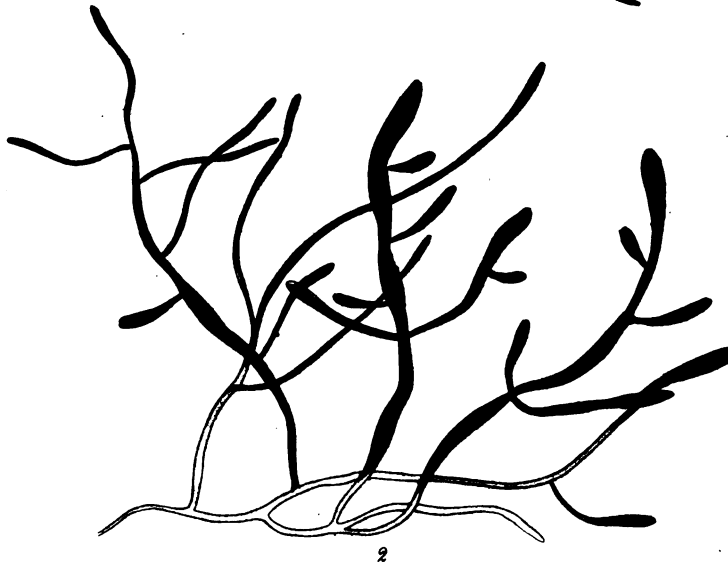
SPHÆRIA aurantiaca, *Gray's Nat. Arr.* v. 1. p. 526.

HAB. On decaying Fungi, such as various *Agarici, Boleti,* &c. Rare. Newliston woods, near Edinburgh, in the autumn, Messrs WAUCH and GREVILLE.

Spherules minute, densely crowded, and appearing at first, like broad, irregular, orange-yellow spots, which spread over the decaying lamellæ of Agarics, and pores of *Boleti;* on a minute examination the mouths of the spherules are perceived, protruded through a reddish-orange tomentose substance, which forms a thin close web, and closely surrounds the base of the mouths, which are short, and very obtuse. The *spherules* are nearly round, and while young are of a succulent substance; as the fungus dries on which they are parasitic, they sometimes become half exserted. *Sporules* elliptical-oblong, in slender diaphanous tubes or thecæ, lying in a gelatinous mass, which often escapes at the orifice, and dries into a white powder.

A pretty, minute species, well marked by the orange web with which it is surrounded, and remarkable for the peculiar succulency of the spherules, in which it varies from almost all its congeners. It is by no means of frequent occurrence, and is new to Great Britain, not having been described by any British author except Mr GRAY.

Fig. 1. *Cryptosphæria aurantia, nat. size, on Agaricus integer.* Fig. 2. *Spherules, magnified.* Fig. 3. *Thecæ and filaments.* Fig. 4. *Sporules.*



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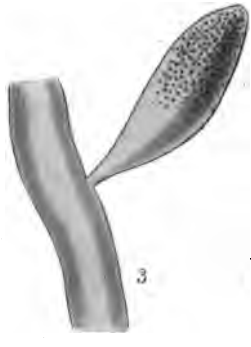

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CHONDRIA PUSILLA.

Dwarf Chondria.

CLASS AND ORDER CRYPTOGAMIA ALGÆ, *Linn.*—NAT. ORD. *ALGÆ, Juss. De Cand. Grev.*, &c.

GENERIC CHARACTER.

Frons continua, filiformis, gelatinoso-cartilaginea. Fructificatio duplex; sporulæ nudæ substantiæ ramulorum immersæ et tuberculæ externæ.

Frond continuous, filiform, between gelatinous and cartilaginous. Fructification double; naked sporules immersed in the substance of the ramuli and external tubercles.

SPECIFIC CHARACTER.

CHONDRIA pusilla; *fronde cartilagineo-cornea, compressa, filiformi, hic illic articulato-contracta, ramosissima; ramulis horizontalibus basi attenuatis, apice dilatatis et rotundatis.*—(Turn.)

Ch. frond cartilagino-corneous, compressed, filiform, here and there contracted as if jointed, much branched; branches horizontal, attenuated at their base, dilated and rounded at their apex.

CHONDRIA pusilla, *Hook. Fl. Scot.* 2. p. 106.—*Grev. Fl. Edin. ined.* p. 392.

FUCUS pusillus, *Stackh. Ner. Brit.* p. 16. t. 6.—*Turn. Hist. Fuc.* v. 2. p. 99. t. 108.

ULVA filiformis, *Fl. Dan.* t. 949.?

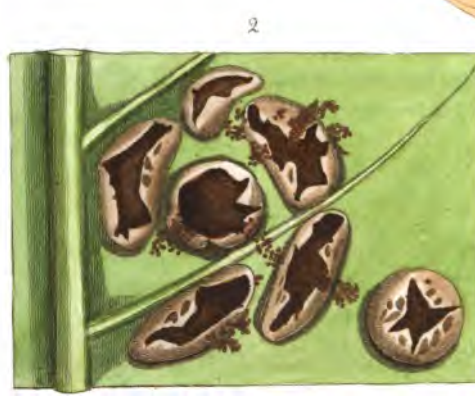
HAB. In the sea. Rocks opposite Caroline Park, near Edinburgh, Dr RICHARDSON. I subsequently found it in same station, without being aware of Dr RICHARDSON's priority.—In England, since Mr STACKHOUSE discovered it near Sidmouth, it is recorded to have been seen only by Mr BORRER at Brighton, and elsewhere on the Sussex coast. It is perennial, and in perfection about May.

Plant of a purple pink color, smooth, shining, spreading over the rocks for many inches like *Chondria opuntia*. *Root* creeping, and passing insensibly into the fronds. *Fronds* very entangled, much branched, ascending, from half an inch to above one inch long, almost flat, very variable in thickness, even from a fine bristle to one-third of a line, here and there contracted, and often suddenly attenuated or incrassated. *Branches* dilated towards the rounded apex, patent, and often bearing minute, club-shaped ramuli. *Fructification* double; naked red sporules immersed in the ramuli, and minute, external, blackish tubercles? *Substance* somewhat corneous. It scarcely adheres to paper in drying.

Chondria pusilla has been seen by few individuals, and must be considered an interesting as well as a rare plant. Mr STACKHOUSE, who was its discoverer, figured it in his *Nereis Britannica*. Mr TURNER gave it a place in his truly admirable and elaborate work, the *Historia Fucorum;* and these, with the recent insertion of it in Dr HOOKER's *Flora Scotica*, are the only notices of it that I am able to trace. I have quoted the *Flora Danica* doubtfully, as Mr TURNER has also done, on account of the green color there attributed to it. That figure is also rendered more dubious, from the fact, that LYNGBYE, in his *Tentamen Hydrophytologiæ Danicæ*, considers it as a *Vaucheria*, and the same as V. *clavata*, (*Ectosperma clavata* of VAUCHER). The tubercular fructification I could never detect on my specimens, and have therefore borrowed the representation given by Mr TURNER, who observes, that the appearance might possibly be produced by extraneous bodies adhering to the frond.

Chondria pusilla most resembles *Chondria Opuntia*, but wants the internal fibrous structure, and the more frequent and regular contractions; it is also of a more rigid substance, and redder colour.

Fig. 1. *Chondria pusilla, nat. size.* Fig. 2. *A portion of a frond magnified.* Fig. 3. *One of the ramuli with naked immersed sporules.* Figs. 4. & 5. *The tubercular fructification; the general appearance borrowed from Mr Turner's plate.*



80.

UREDO Polygonorum.

Polygonum Uredo.

Class and Order CRYPTOGAMIA FUNGI, *Linn.*—Nat. Ord. *GASTROMYCI, Grev.*—EPIPHYTÆ, *Link.*

GENERIC CHARACTER.

Peridium verum 0. *Sporidia non septata, nuda, libera. Plantulæ "sub epidermide foliorum herbacearum ortæ et epidermide rupta facilè dispersæ,"* DC. *Epidermis peridio simillima.*

No true peridium. Sporidia unilocular, naked, free, bursting through the epidermis of the leaves of herbaceous plants, and easily dispersed; epidermis resembling a true peridium.

SPECIFIC CHARACTER.

Uredo Polygonorum; *plerumque hypophylla, orbiculata, rarius in circulo disposita, pallido-fusca, sporidiis globosis.*

U. mostly hypophyllous, orbicular, sometimes disposed in a circular manner, pale brown, the sporules globose.

Uredo Polygonorum, *De Cand. Fl. Franç.* ed. 3. v. 6. p. 71.—*Fl. Dan.* t. 1318.—*Grev. Fl. Edin. ined.*

Uredo Betæ, var. *ββ*, *Alb. et Schwein. Conspect. Fung.* p. 358.

Uredo vagans, *γ*, *DC. Syn. Fl. Gall.* p. 47.

Hab. On the leaves of *Polygonum amphibium, P. convolvulus,* and *P. aviculariæ.* Summer and autumn, very frequent.

Scattered or arranged in small circles, of a pale brown colour, mostly round, but when growing in a circle (in which case there is always a central one), the little tufts are of an oval or oblong figure. *Sporules* numerous, globular, some of them furnished with minute pedicels.

This *Uredo* seems to be common to a number of the *Polygoni*, and is therefore well named by De Candolle. Whether physical properties, or a peculiar organization in natural families of phænogamous vegetables, have any influence upon the external characters of such plants as are parasitic upon them, is difficult to decide, yet highly probable. It is certain,

that *Uredines*, *Pucciniæ*, *Æcidia*, and other minute GASTROMYCI, as well as several individuals of the Order BYSSOIDEÆ, are often exceedingly partial to particular vegetables, and often wholly confined to a natural order, or even section of an order, and retain their distinctive character. Although a part of this character may be derived from the vegetable on which they grow, it is by no means conclusive, that most *Uredines*, &c. are the same species, modified by circumstances, as some botanists have supposed; for *Uredines* of different sections in regard to colour, and also of different forms in regard to their *sporidia*, frequently occur on the same plant, nay even on the same leaf.

Fig. 1. *Uredo Polygonorum, on Polygonum amphibium, nat. size.* Fig. 2. *A group magnified.* Fig. 3. *Sporidia.*

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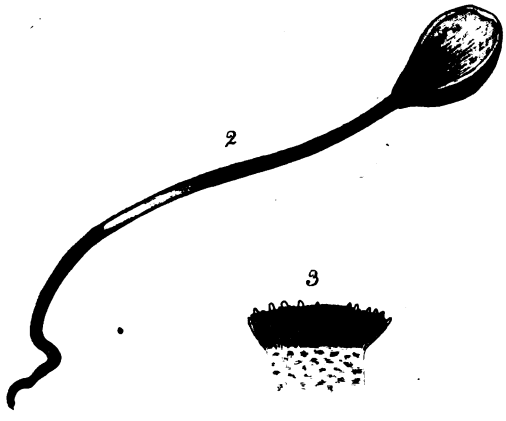

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LEOTIA MITRULA.

Pine Leotia.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *FUNGI, Link, Grev.*

GENERIC CHARACTER.

Pileus ovato-conicus aut orbicularis, fructificatione undique instructus, margine libero, stipitem arcte ambienti.

Pileus ovate-conical or orbicular, wholly occupied by the fructification; the margin free, closely embracing the stipes.

SPECIFIC CHARACTER.

LEOTIA Mitrula; *gregaria, subminuta, pileo ovato, flavo-ferrugineo; stipite basi attenuato, et flexuoso.*

L. gregarious, rather minute; pileus ovate, yellowish, reddish-brown; stipes attenuated and flexuose at the base.

LEOTIA Mitrula, *Pers. Syn. Fung.* p. 611.—*Ejusd. Mycol. Europ.* v. 1. p. 199.—*Alb. et Schw. Conspect. Fung.* p. 295.—*Schmidt et Kuntz, Pl. Exsicc.* No. 98.—*Grev. Fl. Edin. ined.*

LEOTIA pusilla, *Nees, Syst.* p. 178. t. 17. f. 160.

MITRULA Heyderi, *Pers. Disp. Meth. Fung.* p. 36. t. 3. f. 12.—*Fl. Dan.* t. 1670.—*Gray's Nat. Arr.* v. 1. p. 660.

MITRULA HEYDERIA Abietis, *Fries, Syst. Mycol.* v. 1. p. 492.

MITRULA HEYDERIA pusilla, *Fries*, l. c. p. 493.

CLAVARIA ferruginea, *Sow. Fung.* t. 84.

ELVELLA cucullata, *Batsch. Elench. Fung. Cont.* 1. t. 26. f. 132.

HAB. In Fir-woods, especially under the Larch and Spruce Fir. Autumn. Woods at Balmuto, Fifeshire.—In England, I am not aware of any one having found it except SOWERBY, who met with it near Norwich, as early as 1794.

Plant extremely gregarious, and varying much in size. *Pileus* from half a line to three lines from the base to its apex, of an ovate form generally speaking, but by no means constant: it is however always smooth, more or less of a yellowish-red or pale cinnamon colour, and subcarnose texture. The margin embraces the stipes so closely, as at first sight to appear confluent with it. Within, the pileus is whitish-brown, and somewhat pithy. *Hymenium* occupying the whole surface of the pileus. *Sporules* roundish, in short hyaline tubes. *Stipes* rather firm, slender, half an inch to above one inch high, of a darker color than the pileus, smooth, solid, attenuated and flexuose at the base.

A very pretty little fungus, of no common occurrence in this country, though said to be frequent on the Continent. It seems to confine itself rigidly to fir woods and plantations, delighting to grow under the protecting shade of those trees which spread their branches near to the ground.

I cannot perceive any essential difference between the *Leotia Mitrula* and the *L. pusilla* of authors, although even FRIES has retained both species. His own characters will, I think, bear me out in uniting the two.—They are "*parva, clavula cinnamomea, stipite badio*;" and "*minima, clavula ferruginea, stipite pallidiore.*" I have always found them growing intermixed.

Fig. 1. *A group of Leotia Mitrula, nat. size.* Fig. 2. *A section of a plant.* Fig. 3. *Hyaline sporuliferous tubes.*

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SPHÆRIA LIGNARIA.

Black wood Sphæria.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *HYPOXYLA, De Cand. Grev.*

GENERIC CHARACTER.

Receptaculum 0. *Sphærulæ corneæ, liberæ, sessiles aut subimmersæ, sparsæ vel congestæ, ore interdum elongato, aliquando nullo; intùs massa gelatinosa sporulifera instructæ.*

Receptacle 0. Spherules corneous, free, sessile or slightly immersed, scattered or crowded, the mouth sometimes elongated, at others wanting. Interior filled with a gelatinous sporuliferous mass.

SPECIFIC CHARACTER.

SPHÆRIA lignaria; *sphærulis minutis, solitariis vel subcongestis, nigris, ovatis, setoso-rugosis, astomis; sporulis ovalibus in tubis cylindricis.*

SPH. spherules minute, solitary or somewhat clustered, black, ovate, setoso-rugose, mouthless; sporules oval, in cylindrical tubes.

HAB. On wood. Appin, Captain CARMICHAEL.

Spherules very minute, a cluster of four or five not being larger than a Poppy-seed; deep black, ovate, rough with a very short and coarse villosity. They often originate from beneath the surface of the wood on which they grow, but penetrate through it, and at length become sessile. I can find no trace of an orifice. *Sporules* oval, yellowish, contained in filiform, hyaline, cylindrical tubes

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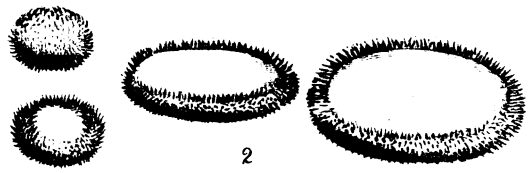
To Captain CARMICHAEL, author of the excellent account of Tristan d'Acunha, in the twelfth volume of Linnean Transactions, I am indebted for this, and a great number of other new Cryptogamic plants, which will from time to time find a place in this publication. Few botanists have been more successful than that gentleman, especially in the discovery of rare marine vegetables.

Fig. 1. *Sphæria lignaria, nat. size.* Fig. 2. *Spherules, magnified.* Fig. 3. *A single spherule.* Fig. 4. *A section.* Fig. 5. *Hyaline tubes of the interior, containing sporules.*



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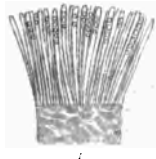

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PEZIZA SULPHUREA.

Minute yellow bristly Peziza.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *FUNGI, Link, Grev., &c.*

GENERIC CHARACTER.

Pileus stipitatus aut sessilis, plus minusve cupuliformis vel complanatus, tubulis elongatis sporuliferis in pagina superiore.

Pileus sessile or stipitate, dilated upwards into a variable cup-shaped or flattish receptacle, having sporules contained in elongated tubes, whose summits terminate on the superior surface.

SPECIFIC CHARACTER.

PEZIZA sulphurea; *minuta, sessilis, gregaria; pileo globoso demum explanato, strigoso-hirsuto, sulphureo, hymenio albido.*

P. minute, sessile, gregarious; pileus globose, at length plane, strigoso-hirsute, sulphur-yellow; hymenium whitish.

PEZIZA sulphurea, *Pers. Disp. Meth. Fung.* p. 33.—*Ejusd. Syn.* p. 649.—*Ejusd. Mycol. Europ.* v. 1. p. 250.—*Alb. et Schwein. Conspect. Fung.* p. 319.—*Fries. Syst. Mycol.* v. 2. p. 104.—*Schwein. Syn. Fung. Carol. Sup.* No. 1189.—*Gray's Nat. Arr.* v. 1. p. 665.—*Grev. Fl. Edin. ined.*

PEZIZA albo-lutea, *Pers. Icon. et Desc. Fung.* p. 31. t. 8. f. 4,-5.?

HAB. On the decaying stems of the larger herbaceous plants, in spring and autumn, very frequent.

Plant gregarious, minute, at first globose and closed, at length expanded, and in moist weather quite plane, hairy and strigose, of a pale or sulphur-yellow. *Hymenium* (disk) mostly white, but sometimes tinged with yellow or pink. *Sporuliferous tubes*, slender, equal. *Sporules* roundish.

If the objects on which the cryptogamist bestows his attention be thought inferior in dignity to those which occupy the mind of the student of the higher orders of vegetation, it must be acknowledged that the former has many advantages; every season is favourable to his researches,—no situation so

barren as not to afford some subject for investigation,—and he is ever discovering something new and unexpected. The present minute species of *Peziza* is abundantly diffused throughout Europe, and delights in situations where it must be sought in order to be seen; and, though undescribed as a British plant, it will be found to be plentiful in every part of the country. There is scarcely a mass of dead herbaceous plants of the larger size which does not possess it; scarcely a bed of decaying Nettles in which, along with many other interesting things, it may not be found. It is one of a numerous, primary division, well marked by their wax-like substance, and pilose or villous surface. But the specific distinctions are not so satisfactory, and I am half inclined to consider P. *variecolor* of FRIES the same as our present one. P. *Nidulus* and *villosa* also approach very near to it.

Fig. 1. *Peziza sulphurea, nat. size.* Fig. 2. *Plants in different states, magnified.* Fig. 3. *A section.* Fig. 4. *Hyaline tubes, containing sporules.*

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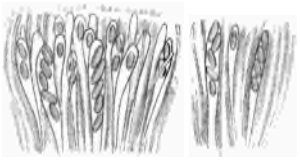

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CUCURBITARIA BERBERIDIS.

Berberry-stem Cucurbitaria.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *HYPOXYLA*, *De Cand. Grev.*

GENERIC CHARACTER.

Spherulæ corneæ, cæspitosæ, liberæ, receptaculo insidentes, raro primo inclusæ; intus massa gelatinosa sporulifera repletæ.

Spherules corneous, tufted, free, fixed on a receptacle, sometimes at first included. Interior filled with a gelatinous sporuliferous mass.

SPECIFIC CHARACTER.

CUCURBITARIA Berberidis; *erumpens, sphærulis congestis, rotundis, nigris, astomis, rimoso-rugosis, receptaculo sessilis; sporulis magnis, ovalibus.*

C. spherules bursting through the bark; crowded, round, black, mouthless rimoso-rugose, sessile on the receptacle; sporules large, oval.

CUCURBITARIA Berberidis, *Gray's Nat. Arr.* v. 1. p. 519.—*Grev. Fl. Edin. ined.*

SPHÆRIA Berberidis, *Pers. Disp.* p. 3.—*Ejusd. Syn.* p. 52.—*Alb. et Schwein. Consp. Fung.* p. 25.—*De Cand. Fl. Franç.* ed. 6. v. 2. p. 293.—*Ejusd. Syn.* p. 61.—*Schwein. Syn. Fung. Carol. Sup.* No. 129.—*Nees' Syst.* p. 78. t. 41. f. 324.

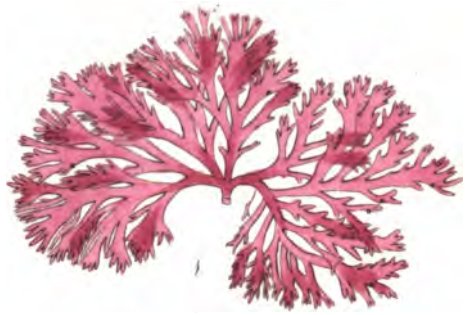
HAB. On the dead stems and branches of the Common Berberry (*Berberis vulgaris*). About Edinburgh. Spring.

Whole *plant* 2–4 lines in length, bursting longitudinally through the bark, in an oblong elliptical form. *Spherules* sessile on the thick, blackish, subcorneous receptacle, black, rugose, rather numerous, very crowded, yet free, the surface rugose and cracked in a tesselated manner. No orifice is perceptible. When in perfection, the spherules are white within, and filled with a gelatinous mass, containing the sporules in their hyaline club-shaped tubes. *Sporules* large, oval, yellow.

I have already figured one species of this genus at Plate 50. of this work. The present one is not common, and, except in

Mr GRAY's Arrangement, is not described as British. No one can be better marked, or more constant to its characters.

Fig. 1. *Cucurbitaria Berberidis, nat. size.* Fig. 2. *An entire plant, magnified.* Fig. 3. *Spherules seated on the receptacle, one of them divided.* Fig. 4. *Hyaline sporuliferous tubes.* Fig. 5. *Sporules.*



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SPHÆROCOCCUS CRISTATUS.

Crested Sphærococcus.

CLASS AND ORDER CRYPTOGAMIA ALGÆ, *Linn.*—NAT. ORD. *ALGÆ, De Cand. Grev.*

GENERIC CHARACTER.

Frons plana, plerumque rubra. Fructificatio simplex, tubercula globosa.

Frond plane, mostly red. Fructification simple, globose tubercles.

SPECIFIC CHARACTER.

SPHÆROCOCCUS cristatus; *fronde membranacea, subdichotoma, avenia; ramis alternis, decurrentibus, apice incisis, plerumque dilatatis; tuberculis ad apices marginemque sessilibus.*

SPH. frond membranaceous, subdichotomous, veinless; branches alternate, decurrent, cut, and mostly dilated towards the apex; tubercles sessile at the apex and margin.

SPHÆROCOCCUS cristatus, *Ag. Syn.* p. 29.—*Lyngb. Hydroph. Dan.* p. 13. t. 4.—*Grev. Fl. Edin. ined.*

FUCUS cristatus, *Herb. Linn.*—*Turn. Hist. Fuc.* t. 23. excl. v. γ.—*Tonn. Amœn. Acad.* v. 7. p. 477.

FUCUS gigartinus? *Fl. Dan.* t. 394.—*Mohr, Hist. Isl.* p. 247. *fide Fries.*

HAB. Sea-shore, very rare. Firth of Forth, on the larger marine plants. Between Newhaven and Caroline Park. August.

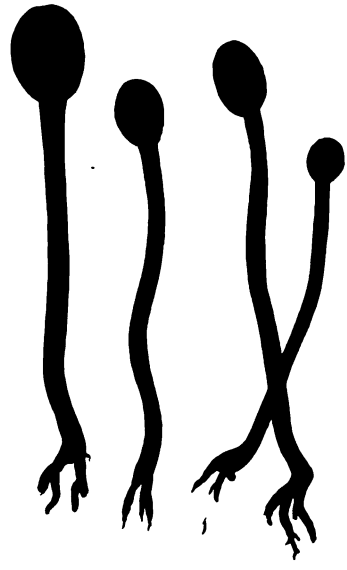
Root a small callous, from which arise several fronds like *Delesseria alata*, of a fine red colour. *Frond* membranaceous, 1–2 inches long, branched in rather a crowded and spreading manner. *Branches* about a line broad, plane, alternate, decurrent, dilated upwards, cut or even laciniate at the apex, the laciniæ spreading, rather obtuse. *Fructification* sessile, dark red, spherical tubercles, either at the margin of the branches, or at the apex of the laciniæ, and containing sporules. *Substance*, when recent, somewhat cartilaginous; when dry, membranaceous, and adhering very closely to paper.

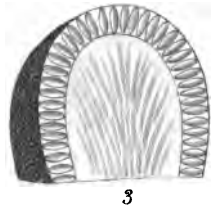
It is with considerable satisfaction that I present the British botanist with a representation of the true *Sphærococcus cristatus*; for, with all deference to the known acuteness and

scientific accuracy of Mr TURNER, who transmitted the specimen figured under that name in English Botany, I cannot believe the plant there published to belong to our species. It has a totally different habit, and, besides being merely compressed instead of plane, appears to have the articulations of that group of marine algæ named *Hutchinsia* by AGARDH, as indeed Sir JAMES EDWARD SMITH has justly remarked. So far the figure in English Botany. In an attentive examination of specimens from Miss HUTCHINS (which are three inches long, and of a black red colour), I find the structure rather resembling that of a *Ceramium*, the joints perfectly regular and distinct towards the extremity of the branches, which divide precisely as in many *Hutchinsiæ* of AGARDH; and, what may be regarded as conclusive in removing it from *Sph. cristatus*, each of the minute cylindrical divisions terminates in a long, hyaline, jointed filament, which also occurs in several species of *Hutchinsia*, and is present in a new individual I hope to publish in the next Number. It may be observed, that my specimens from Miss HUTCHINS grew on rocks, amidst sand and shells,—a situation very different from that of the true *cristatus*.

The specimen from which the annexed figure is taken, was found on the coast near Edinburgh, attached to an old stipes of *Laminaria digitata*, and is probably the only British specimen in existence.

Fig. 1. *Sphærococcus cristatus, nat. size.* Fig. 2. *A branch, magnified.* Fig. 3. *One of the ramuli, with tubercles.* Fig. 4. *A tubercle.* Fig. 5. *Sporules.*





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XYLARIA GRACILIS.

Slender Xylaria.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *HYPOXYLA, De Cand. Grev.*

GENERIC CHARACTER.

Receptaculum carnosum vel suberosum, stipite præditum. Sphærulæ in receptaculo immersæ, intùs massa gelatinosa sporulifera repletæ.

Receptacle carnose or suberose, furnished with a stipes. Spherules immersed in the receptacle, and containing a gelatinous sporuliferous mass.

SPECIFIC CHARACTER.

XYLARIA gracilis; *stipite elongato, cylindraceo, equali, subflexuoso; receptaculo lævi, ovato-rotundato, fusco; sphærulis oblongis, pallidis.*

X. stipes elongated, cylindrical, equal, somewhat flexuose; receptacle smooth, roundish-ovate, brown; spherules oblong, pale.

HAB. On the ground, in moist mossy places. Shetland, W. C. TREVELYAN, Esq.

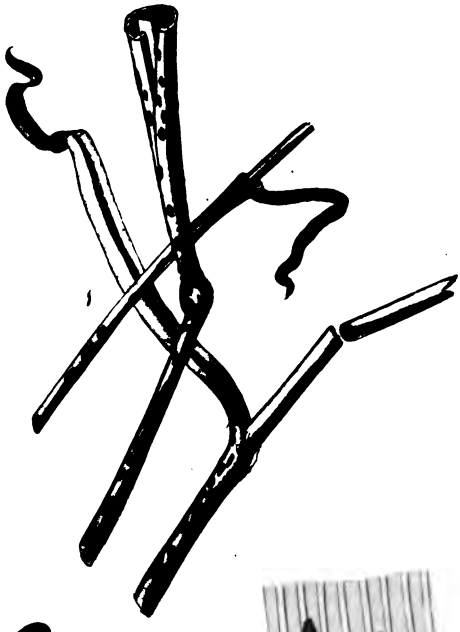
Plant subgregarious. *Root* composed of a few stout divisions, each throwing out fibres, but not freely. *Stipes* 1–2 inches long, erect, a line or more in diameter, firm, somewhat flexuose, equal, ochraceous-brown, of a coriaceous texture. *Receptacle* roundish-ovate, one-fourth to one-third of an inch long, smooth, between carnose and coriaceous, and of a darkish-brown colour. *Spherules* very pale, occupying the whole exterior of the receptacle, oblong, with a short narrow neck, which is seen only on dissection, as the mouth does not project from the surface of the receptacle. I have not detected any thing like regular sporules, but the spherules contain a mass of filaments which are very fragile towards their extremities, where I observed a few dissepiments. These, by separating, may perform the office of sporules, as in some BYSSOIDEÆ.

In the introduction of this very distinct and interesting plant to the public, I also lay before them one of a natural group of the old genus *Sphæria*, not hitherto illustrated in this work. They are sufficiently distinguished by the stipes with

which the receptacle is furnished; for in plants holding so low a rank in the scale of vegetation, we are compelled to be satisfied with characters which would not be considered valid in more perfect vegetable forms. Among the earlier botanists, this group was not united with *Sphæria*, and I have adopted the genus *Xylaria* from HILL and from SCHRANK. It divides naturally enough into two sections, as the species are either more or less carnose or suberose. Mr GRAY has constituted genera of both these sections, which is carrying the matter too far.

For the discovery and communication of the present species, I am indebted to my scientific and highly esteemed friend W. C. TREVELYAN, Esq.

Fig. 1. *Plants of Xylaria gracilis, nat. size.* Fig. 2. *A section of the receptacle.* Fig. 3. *A section of part of a receptacle magnified.* Fig. 4. *A spherule removed from the receptacle.* Fig. 5. *The same divided.* Fig. 6. *The appearance of the filaments contained in the spherules, under the microscope.*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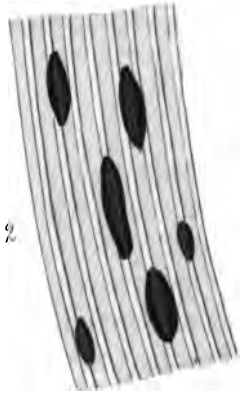
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HYSTERIUM GRAMINEUM.

Grass-culm Hysterium.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *HYPOXYLA*, *De Cand. Grev.*

GENERIC CHARACTER.

Crusta nulla. Peridium plerumque oblongum, corneum, rima longitudinali dehiscens. Sporulæ in tubulis hyalinis elongatis, erectis, gelatinosis.

Crust none. Peridium mostly oblong, corneous, bursting by a longitudinal slit. Sporules contained in hyaline, elongated, erect, gelatinous tubes.

SPECIFIC CHARACTER.

HYSTERIUM gramineum; *minutum, gregarium, oblongo-ellipticum, convexum, nigrum; tubulis sporuliferis filiformibus; sporulis globosis pellucidis.*

H. minute, gregarious, oblong-elliptical, convex, black; sporuliferous tubes filiform; sporules globose, hyaline.

HYSTERIUM gramineum, *Pers.* MSS.—*Moug. et Nestl. Pl. Exsicc.* No. 368.

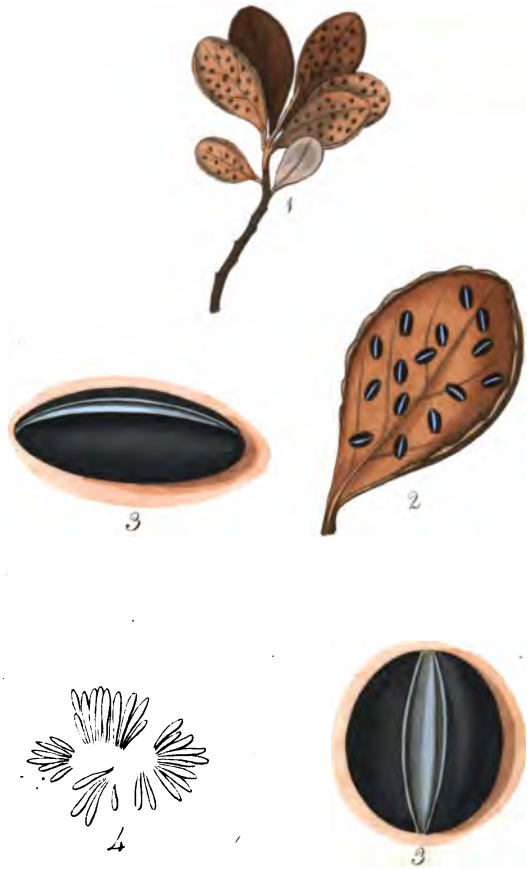
HAB. On the dead culms and leaves of various grasses, extremely common. Autumn.

Gregarious, black, minute, elliptical or linear-oblong, convex, the orifice extending nearly to each extremity. *Sporuliferous tubes* few, hyaline, filiform, obtuse. *Sporules* very minute, round, colourless.

It is surprising that so common a plant should not have earlier attracted the attention of the cryptogamic botanist. The first notice of it I can find, is in the eminently useful work published by Drs MOUGEOT and NESTLER, quoted in the synonymes; but no description or figure of it has yet been given.

It frequently happens, that *Hysterium gramineum* never comes to perfection, owing probably to some cause in the plant on which it is parasitic. It then merely assumes the form of a dark oval line, with no trace of dehiscence.

Fig. 1. *Hyst. gramineum, nat. size.* Fig. 2. *Portion of a culm with the Hysterium, magnified.* Fig. 3. *The latter more highly magnified.* Fig. 4. *Sporuliferous ubes.* Fig. 5. *Sporules.*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HYSTERIUM MELALEUCUM.

Whortleberry-leaf Hysterium.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *HYPOXYLA, De Cand. Grev.*

GENERIC CHARACTER.

Crusta nulla. Peridium plerumque oblongum, corneum, rima longitudinali dehiscens. Sporulæ in tubulis hyalinis, elongatis, erectis, gelatinosis.

Crust none. Peridium mostly oblong, corneous, bursting by a longitudinal slit. Sporules contained in hyaline, elongated, erect, gelatinous tubes.

SPECIFIC CHARACTER.

HYSTERIUM melaleucum; *minutum, nigrum, irregulariter gregarium, ovale vel subrotundum, convexum; tubulis sporuliferis clavatis.*

H. minute, black, irregularly gregarious, oval or roundish, convex; sporuliferous tubes club-shaped.

HYSTERIUM melaleucum, *Fries, Obs. Mycol.* v. 1. p. 192. t. 2. *fide Moug. et Nestl.—Moug. et Nestl. Pl. Exsicc.* No. 654.

HAB. On the dead leaves of *Vaccinium Vitis Idæa*. Ben Lawers. August. Messrs HOOKER, ARNOTT and GREVILLE.

Gregarious, lying in all directions on the leaf, minute, black, very convex, varying in form from oval to nearly round, the orifice extending from end to end, and opening so much as to shew the grey mass of sporuliferous tubes within. *Sporuliferous tubes* rather short, hyaline, clavate. *Sporules* indistinct.

This addition to the British list of *Hysteria*, was made in a late excursion this season (1823), by Dr HOOKER, Mr WALKER ARNOTT and myself. We found it on Ben Lawers, above Loch na Cat, but so sparingly, that very few leaves producing it were discovered. It is a remarkably neat-looking species, and peculiar in the roundness of its figure.

Fig. 1. *Hysterium melaleucum, nat. size.* Fig. 2. *The same magnified.* Fig. 3. *Single plants, more highly magnified.* Fig. 4. *Sporuliferous tubes.*

MORCHELLA HYBRIDA.

Small-headed Morel.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *FUNGI, Link, Grev.*

GENERIC CHARACTER.

Pileus stipitatus, lacunosus, undique hymenio tectus, cum stipite confluens.

Pileus stipitate, lacunose, confluent with the stem, the surface wholly occupied by the hymenium.

SPECIFIC CHARACTER.

MORCHELLA hybrida; *pileo brevi, acuto, conico, olivaceo, basi patulo; areolis longitudinaliter subparallelis; stipite longo, crasso, albido.*

M. pileus short, acute, conical, olivaceous, spreading at the base; areolæ longitudinally subparallel; stipes long, thick, white.

MORCHELLA hybrida, *Pers. Syn. Fung.* p. 620.—*Gray's Nat. Arr.* v. 1. p. 662.—*Grev. Fl. Edin. ined.*

MORCHELLA crassipes, *Pers. Mycol. Europ.* v. 1. p. 206.

HELVELLA hybrida, *Sow. Fung.* t. 238.—*Purt. Midl. Fl.* v. 2. p. 679.—*Winch, Bot. Guide,* 2. p. 98.

HAB. Woods. Spring. Foxhall, Captain WAUCH.—In England, it appears only to have been found by Mr ROBSON near Darlington, and at Badsey by Mr RUFFORD.

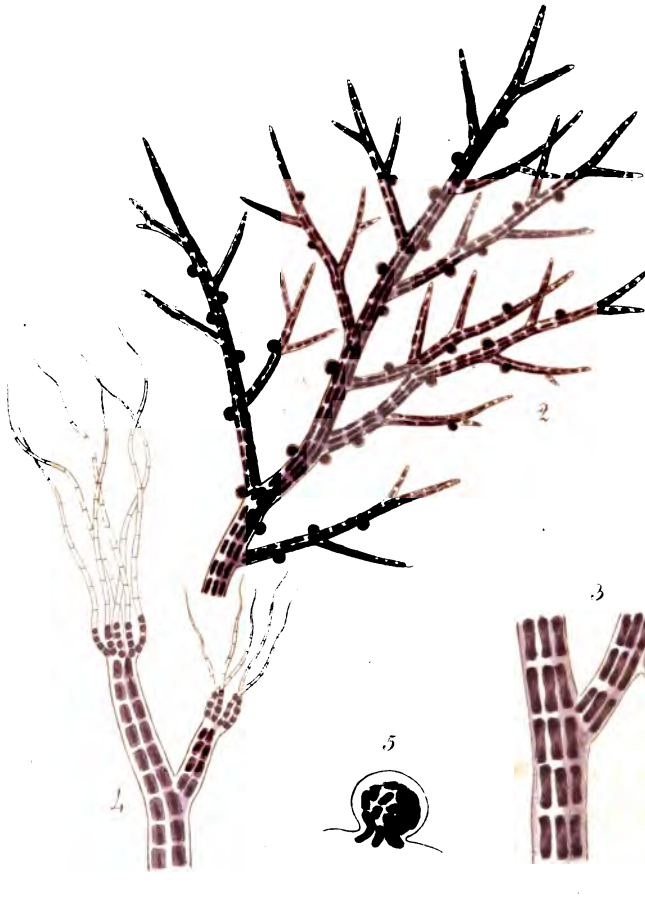
Whole plant 3–5 inches high. *Pileus* one inch to an inch and a half from the base to the apex, and nearly of the same diameter at the base, pale yellowish-brown or olivaceous, the pits or areolæ shallow, divided into tolerably regular longitudinal series by parallel prominent ribs. *Stipes* white, smooth, cylindrical, hollow, three-fourths of an inch thick or more, and passing into the pileus about half an inch above the base. *Hymenium* covering the whole pileus. Tubular *sporuliferous cells* long, filiform. *Sporules* oval, hyaline.

This rare Fungus is confined to Great Britain, and is undoubtedly a well-marked and distinct species. Among all the varieties of M. *esculenta,* I never saw any approach it in the form of the pileus and proportionably long stipes; but the most

decisive difference resides in the spreading base of the pileus, which is not adnate with the stipes at its margin, as in M. *esculenta*, but half an inch above it.

Phallus acuminatus of BATSCH, and MICHELI's figure (t. 84. f. 3.), both quoted by Mr PURTON, I deem far too doubtful to place any reliance on.

Fig. 1. *A young plant.* Fig. 2. *A mature plant.* Fig. 3. *A section.* Fig. 4. *Section of a portion of the hymenium, magnified.* Fig. 5. *Sporuliferous tubes.* Fig. 6. *Sporules.*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POLYSIPHONIA SPINULOSA.

Round-fruited Polysiphonia.

CLASS AND ORDER CRYPTOGAMIA ALGÆ, *Linn.*—NAT. ORD. *ALGÆ, Juss. De Cand. Grev.*

GENERIC CHARACTER.

Frons filiformis (rubra), ramosa, articulata; articuli tubulis pluribus internis striati. Fructificatio duplex; tubercula externa, aut apicibus ramulorum innata.

Frond filiform (red), branched, articulated: articulations striated with several internal tubes. Fructification double; external tubercles, or innate ones towards the summit of the branches.

SPECIFIC CHARACTER.

POLYSIPHONIA spinulosa; *atro-rubescens; ramis divaricatis, subrigidis, ramulis brevibus, strictis, subulatis, divaricatis; articulis diametro subæqualibus, tritubulosis; tuberculis globosis, sessilibus, minutissimis.*

P. dark red, branches divaricate, somewhat rigid, the ramuli short, straight, subulate, divaricate; articulations about equal in length and breadth, 3-tubed; tubercles globose, sessile, excessively minute.

HAB. Sea-shores. Appin, Captain CARMICHAEL.

Frond 1–2 inches in length, of a dark red colour, much branched, with a rigid and spinulose habit; main branches rather remote, irregular, much divaricated, somewhat flexuose; ultimate ramuli straight, subulate, almost thorn-like, divaricated like the rest, sometimes minutely divided at the apex, and each of the divisions terminated by a long, hyaline, jointed filament. *Articulations* about as long as broad, striated with three internal tubes of a pale brown-pink under the microscope. *Tubercles* very minute, quite sessile, round, dark red, scattered freely on the branches, and containing several dark granules.

It is fortunate when the active and intelligent naturalist is rewarded by the discovery of new objects, for the time and patience he expends in bringing to light the more hidden treasures of our Flora. Captain CARMICHAEL, as we have indeed already noticed, has been thus repaid. The present inte-

resting alga is one of his recent acquisitions, and not the least beautiful. As yet it must be accounted extremely rare.

Polysiphonia spinulosa belongs to the genus *Hutchinsia*, constituted by AGARDH in honour of the late excellent Miss HUTCHINS. He could not, however, have been aware, that Mr ROBERT BROWN had previously given the same name to a genus of the Order *Cruciferæ*. As there is no doubt attached to the propriety of Mr BROWN's genus, it is absolutely necessary to change that of AGARDH; and it is only to be lamented, that the great knowledge Miss HUTCHINS possessed of Marine Algæ, cannot be commemorated by bestowing her name on a group of that order. The name I have now given to the genus, is derived from the peculiar structure which all the species possess.

Fig. 1. *Polysiphonia spinulosa, nat. size.* Fig. 2. *A branch magnified,* Fig. 3. *A portion of a main branch, with a tubercle.* Fig. 4. *The termination of a branchlet, with the pellucid filaments.* Fig. 5. *Tubercle.*

AGARICUS PRATENSIS.

Reddish Field Agaric.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *FUNGI, Link, Juss. &c.*

DIV. LEUCOSPORUS CLYTOCYBE, *Fries.*—SECT. III. GYMNOPUS, *Pers.*

GENERIC CHARACTER.

Pileus stipitatus aut latere affixus, subtus lamellis sporiferis, rectis, simplicibus. Volva nulla.

Pileus furnished with a stipes, or fixed by its side, bearing on the under surface straight simple sporuliferous lamellæ. Volva (wrapper) none.

SPECIFIC CHARACTER.

AGARICUS pratensis; *firmus, pileo subcompacto, glabro, convexo-expanso, sæpissime umbonato; lamellis crassis, subdistantibus, decurrentibus; stipite farcto, brevi, deorsum attenuato.*

Ag. firm; pileus somewhat compact, glabrous, between convex and expanded, mostly umbonate; lamellæ thick, subdistant, decurrent; stipes solid, attenuated downwards.

AGARICUS pratensis, *Pers. Comment.* p. 124.—*Ejusd. Syn. Fung.* p. 304.—*Alb. et Schwein.* p. 162.—*Fries, Obs. Mycol.* v. 2. p. 116.—*Ejusd. Syst. Mycol.* v. 1. p. 99.—*Grev. Fl. Edin.* p. 376.

AGARICUS ficoides, *Bull. Champ.* t. 587. f. 1.—*De Cand. Fl. Franç.* ed. 3. v. 2. p. 173.—*Ejusd. Syn.* p. 35.

AGARICUS miniatus, *Schœff. Fung.* t. 313.—*Sow. Fung.* t. 141.

AGARICUS fulvosus, *Bolt. Fung.* t. 56.

AGARICUS fulvus, *With. Bot. Arr.* ed. 6. v. 4. p. 228.

AGARICUS claviformis, *Schœff. Fung.* t. 307.—*With.* l. c. p. 224.

AGARICUS ericeus, *With.* l. c. p. 222.

GYMNOPUS pratensis, *Gray's Nat. Arr.* v. 1. p. 604.

HAB. Pastures and grassy places frequent, throughout the kingdom. Autumn.

Pileus convex, at length spreading towards the margin, but leaving the centre generally more or less convex, as if umbonate; glabrous, margin often cracked, frequently contracted or lobed here and there; *colour* buffish, reddish, or brownish, varying in intensity. *Flesh* whitish, thick in the centre, thin at the margin. *Lamellæ* distant, thick, 2–4 in a set, decurrent, connected at the base by transverse veins or rugæ. The lamellæ may be se-

parated from the flesh of the pileus as represented at Fig. 2. *Stipes* solid, rarely straight, 1–2 inches long, 3–8 lines thick or more, whitish, attenuated towards the base.

A common species, but not very generally understood, if we may judge from the number of names it has received. Its characters are, however, tolerably constant, especially the short stipes attenuated downwards, the thick and distant lamellæ, which are almost always wrinkled at their base. This species is also subject to frequent irregularities in form, and even distortions, which farther contribute to characterise it. If two plants happen to be in contact, they often grow into each, and become confluent.

By dividing the *lamellæ* transversely, it will be perceived that they are separable in a body from the flesh of the pileus, and sometimes may be partly unfolded, as in *Agaricus contiguus*. This is by no means a common property.

Fig. 1. *A section of a plant.* Fig. 2. *Lamellæ and pileus divided transversely.* Fig. 3. *Sporules.*—Figs. 2. & 3. *magnified. All the other figures represent the plant in different states and forms.*

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BRYUM DEMISSUM.

Small pyriform Bryum.

CLASS AND ORDER CRYPTOGAMIA MUSCI, *Linn.*—NAT. ORD. *MUSCI, Juss. De Cand.* &c.

GENERIC CHARACTER.

Seta terminalis. Peristomium duplex: ext. e dentibus 16*: int. membrana plicata* 16*-laciniata, sæpissime ciliis alternantibus. Calyptra dimidiata.*—(*Hook.*)

Seta terminal. Peristome double; the exterior of 16 teeth; the interior of a membrane divided into 16 segments, mostly alternating with filiform processes. Calyptra dimidiate.

SPECIFIC CHARACTER.

BRYUM demissum; *caule perbrevi ramoso; foliis ovatis cuspidato-acuminatis, reticulatis, nervo excurrente; seta arcuata; theca curvato-pyriformi, pendula.*—(*Hook*).

Br. stem very short, branched; leaves ovate, cuspidato-acuminate, reticulated, the nerve excurrent; seta arched; theca curved and pyriform, pendulous.

BRYUM demissum, *Hook. Musci Exot.* v. 2. t. 99.
MEESIA demissa, *Hoppe et Hornsch. MSS.*
TIMMIA, nov. sp. *Schmidt, MSS.*
BRYUM curvulum, *Schleicher, MSS.*
} *fide Hook.*

HAB. On Craig-Halleach in Breadalbane, and the neighbouring mountains, Dr HOOKER. In the same station, afterwards by Mr ARNOTT. July—August.

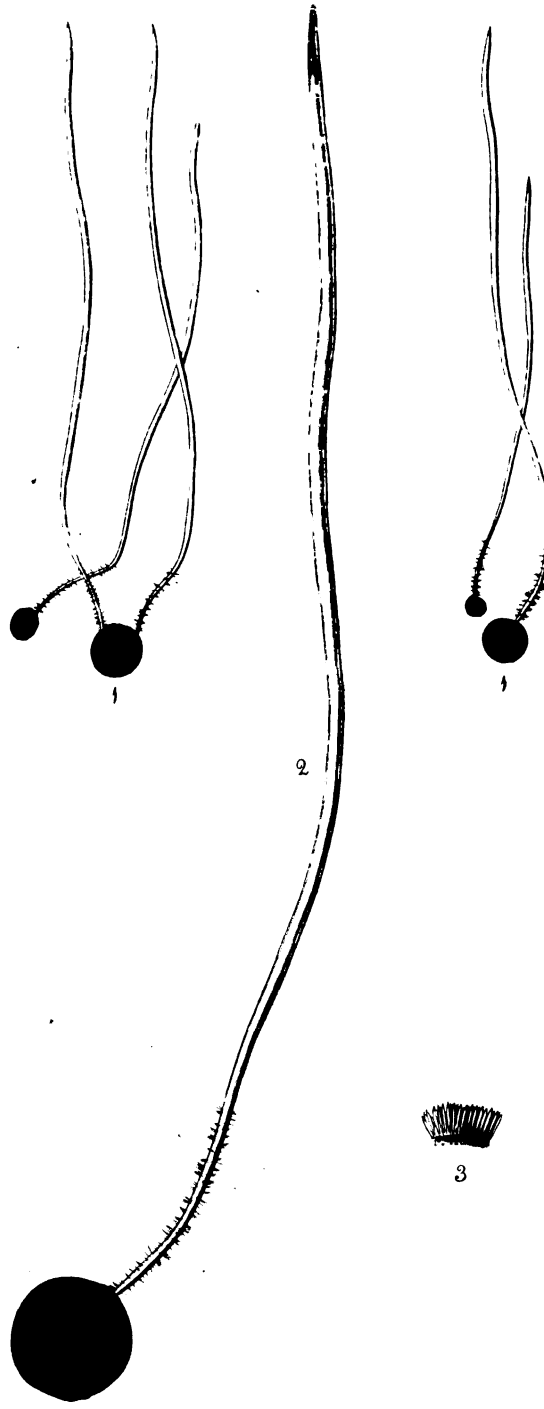
Plant growing in small tufts. *Stems* 1–5 lines long, with a few simple branches arising from their base in a subfasciculate manner. *Leaves* imbricated, slightly concave, yellowish-green, reddish at the base, ovato-acuminate, the apex almost piliferous, margin entire, reticulated with rather large, oblong cellules; nerve rather strong, of a reddish colour, excurrent. *Seta* $\frac{1}{4}$–$\frac{3}{4}$ of an inch in length, remarkably curved at the top. *Theca* pendulous, oblong-pyriform, curved, yellowish-brown, with a very small mouth not exactly situated at the apex. *Operculum* shortly conical. *Ext. Peristome* composed of 16 acuminated teeth, their lower half of a fine pink colour. *Int. Peristome* of ciliary processes, irregularly cancellated. *Sporules* green, globose, united in threes.

Of this moss, which has been recently discovered in Scotland by my friend Dr HOOKER, I have little more to add to what he has already observed in his beautiful *Musci Exotici*. He there mentions, that he first observed it in Switzerland in the summer of 1814, near to one of the highest summits of Mount Cenis; and that he afterwards received it from Professor SCHMIDT, Professor HORNSCHUCH, and from SCHLEICHER. Dr HOOKER has in my opinion very correctly rejected it as either a *Timmia* or *Meesia*, and observes that it approximates to *Bryum cæspiticium* in its leaves, and to *Bryum Zierii* in the form of its theca.

Bryum demissum is a highly interesting addition to our Flora, and exists probably on many of the Highland mountains. It seems to delight in bare precipitous spots, and in such rocky clefts as produce *Bryum Zierii*.

The uppermost leaves are much more attenuated than the lower ones. That represented at Fig. 5. should have had a longer point.

Fig. 1. *Tufts of Bry. demissum, nat. size.* Fig. 2. *A separate plant.* Fig. 3. *A young theca.* Fig. 4. *A mature theca, having lost the operculum.* Fig. 5. *A leaf.* Fig. 6. *Teeth of the Ext. Peristome.* Fig. 7. *Int. Peristome.* Fig. 8. *Sporules.—All but* Fig. 1. *more or less magnified.*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PHACORHIZA FILIFORMIS.

Slender Phacorhiza.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *FUNGI, Link, Juss.* &c.

GENERIC CHARACTER.

Hymenium clavatum vel filiforme, cum stipite plerumque plus minusve confluens. Stipes tuberculo radiculi insidens.

Hymenium (fructifying surface) club-shaped or filiform, generally more or less confluent with the stipes, which arises from a small radicular tuber.

SPECIFIC CHARACTER.

PHACORHIZA filiformis; *simplex, alba, elongata, filiformi-subulata; hymenio cum stipite confluenti; tuberculo rotundo, compresso, nigro-fusco.*

Ph. simple, white, elongated, filiform, subulate; hymenium confluent with the stipes; radicular tuber round, compressed, dark brown.

PHACORHIZA filiformis, *Grev. Fl. Edin.* p. 415.

TYPHULA phacorhiza, *Fries, Syst.* v. 1. p. 495.

CLAVARIA phacorhiza, *Reich. in Act. Berol.* v. 1. p. 515. t. 9. f. 4–5.—*Sow. Fung.* t. 253.—*Pers. Syn. Fung.* p. 607. & *Mycol. Europ.* v. 1. p. 192.—*Purt. Midl. Fl.* v. 3. p. 268.—*With. Bot. Arr.* ed. 6. v. 4. p. 430. *excl. syn. Bolt. et Mich.*—*Winch, Bot. Guide,* v. 2. p. 103.

HAB. On damp gravel-walks, and among dead leaves in woods. Autumn. Balmuto, Fifeshire.—In England it has been found by SOWERBY at Walthamstow, and Kensington Gardens; near Darlington by Mr ROBSON; also at Allesly by the Reverend Mr BREE.

Whole *plant* 2–4 inches long, whitish, extremely slender, filiform, smooth, more or less attenuated at the apex, flexuose or straight, the *hymenium* gradually passing into the stipes, which is generally minutely tomentose or strigose at the base. *Radicular tuber* dark brown, compressed, roundish, as large sometimes as the seed of a common vetch.

In the 1st volume of this work, I have figured one species of *Phacorhiza*, and have explained my reasons for extending the genus to all those *Clavariæ* which possess a radicular tuber.

In the present plant, as well as in *Ph. erythropus*, I cannot perceive that the stipes issues from the tuber, as represented by SOWERBY, but appears to have the same kind of attachment as exists between *Agaricus tuberosus* and its tuber-like root. I do not think it can be doubted that it is actually a part of the plant, and not an extraneous body. Abortive plants of the present species vary wonderfully in habit from the fertile ones; they are chiefly met with among dead leaves, and frequently reach 5 or 6 inches in length, are often branched and much entangled; in diameter scarcely exceeding a human hair. This change appears analogous to that which has been observed in *Agaricus androsaceus*, when growing beneath a mass of dead leaves, and which has been described as a *Rhizomorpha*.

Fig. 1. *Plants of Phacorhiza filiformis, nat. size.* Fig. 2. *A plant magnified.* Fig. 3. *Tubular thecæ, in which I did not succeed in detecting sporules.*

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ERINEUM TORTUOSUM.

Entangled Birch-leaf Erineum.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *GASTROMYCI, Grev.*—MUCEDINES, *Link.*

GENERIC CHARACTER.

Peridia flocciformia, subdiaphana, varia, subsimplicia aggregato-cæspitosa, foliis vivis parasitica. Sporulæ minutissimæ, sæpissime subnullæ.

Peridia flocciform, subdiaphanous, various, subsimple, aggregato-cæspitose, parasitic on living leaves. Sporules most minute, very frequently invisible.

SPECIFIC CHARACTER.

ERINEUM tortuosum; *amphigenum, maculæforme, irregulare, subimmersum, albo-ferrugineum; peridiis linearibus, cylindricis, tortuosis, apicibus rotundatis.*

E. on both sides of the leaf, in irregular spots, subimmersed, white, at length ferruginous; peridia linear, cylindrical, tortuose, rounded at the apex.

ERINEUM tortuosum, *Grev. in Edinb. Phil. Journ.* v. 6. p. 74. t. 2. f. 2.—*Ejusd. Fl. Edin. ined.*—*Kunze, Mycol. Hefte*, 2. p. 158.

HAB. On Betula alba. Ravelrig Toll, and Bilston Burn, both near Edinburgh; in spring and summer.

Tufts scattered, rarely confluent, somewhat immersed, white, at length unequally ferruginous, preferring the inferior surface of the leaf, which is frequently more or less distorted. *Peridia* long, cylindrical, slender, very flexuose and entangled with each other, rounded, but rarely incrassated at their apex, colourless under the microscope.

A rare plant, as it is not common in this country, and does not appear to have been found on the Continent, from the excellent Monograph recently published by Professor KUNZE in the 2d part of *Mykologische Hefte*. It is the fourth species which has been found on the leaves of the Common Birch.

In the above quoted work, which I have just received from the learned author in time to avail myself of its contents, I perceive that we differ considerably in the physiological view

we have taken of this curious genus. Dr KUNZE places it along with PERSOON among the *Byssoideæ;* and makes the absence of sporules a part of the generic character. In many species, they certainly elude the power of our best glasses, yet in some they are sufficiently visible. I have observed them repeatedly in E. *aureum,* and my friend Mr TOZER informs me that he has detected them in several others. On these data, I have ventured to place them among the *Gastromyci,* where they will range not very far from the true *Mucors,* which have their sporules enclosed in a peridium, while, in other respects, they have the habit of the *Byssoideæ.*

The genus *Erineum* has been much increased of late: PERSOON, in his *Mycologia Europæa,* having described 27 species, and KUNZE, in his very admirable Monograph, just published, no fewer than 45. He has treated the subject in a most elaborate manner, and is remarkably complete in his references, not only to figures and descriptions, but to works where the plant itself is published, and which must hold a superior rank, in point of real utility, to any graphic illustration.

Fig. 1. *Erineum tortuosum, nat. size.* Figs. 2.–4. *Filaments more or less magnified.*

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UREDO FABÆ.

Bean-leaf Uredo.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *GASTROMYCI, Grev.*—EPIPHYTÆ, *Link.*

GENERIC CHARACTER.

Peridium verum 0. *Sporidia non septata, nuda, libera. Plantulæ "sub epidermide foliorum herbacearum ortæ et epidermide rupta facilè dispersæ." Epidermis peridio simillima.*

No true peridium. Sporidia unilocular, naked, free, bursting through the epidermis of the leaves of herbaceous plants, and easily dispersed; epidermis resembling a true peridium.

SPECIFIC CHARACTER.

UREDO Fabæ; *sparsa, rotundata, depressa, fusca, epidermide rupta cincta, sporidiis subovalibus pedicello quandoque instructis.*

U. scattered, roundish, depressed, brown, surrounded by the remains of the ruptured epidermis; sporidia somewhat oval, sometimes furnished with a pedicel.

UREDO Fabæ, *Pers. Disp. Meth. Fung.* p. 13.—*Syn. Fung.* p. 221.—*Alb. et Schwein.* p. 127.—*De Cand. Fl. Franç.* ed. 3. v. 2. p. 596. et v. 6. p. 69. *Ejusd. Syn.* p. 47.—*Ejusd. Encyc. Bot.* v. 8. p. 225.

UREDO cincta, *Strauss, in Annal. Soc. Wetterav.* v. 2. p. 95. var. *a.*

UREDO fusca, *Purt. Midl. Fl.* v. 3. p. 507.

HAB. On the leaves and stalks chiefly of the Common Bean (*Vicia Faba*), but also on *Vicia sativa, Lathyrus pratensis,* several species of *Medicago,* and on *Trifolium repens.* Summer and autumn; frequent.

Scattered on both sides of the leaf, and on the stalk, sometimes so numerous as to give the surface a brown colour, and interrupt the growth of the plant. The *spots* are generally of a roundish form, except when growing on the stalk; they are then oval or oblong. The remains of the ruptured epidermis are rather persistent. *Sporidia* roundish or nearly oval, of a reddish-brown colour, and often furnished with a minute pedicel.

This apparently insignificant little plant, is sometimes as injurious to the farmer as the common blight. It spreads pro-

digiously fast, and, if it does not check the growth of the vegetable before arriving at maturity, it materially affects the development of the fructification. I have often seen the Common Bean completely dwarfish and unproductive from its influence. No remedy can remove an evil which arises from within; for the minute seeds are nourished beneath the epidermis, and much of the mischief is done before there is any considerable outward appearance.

Fig. 1. *Uredo Fabæ, on a leaf of the Common Bean, nat. size.* Fig. 2. *Spots magnified.* Fig. 3. *Sporidia.*

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SPHACELLARIA RACEMOSA.

Cluster-fruited Sphacellaria.

CLASS AND ORDER CRYPTOGAMIA ALGÆ, *Linn.*—NAT. ORD. *ALGÆ, De Cand. Hook. Grev.*

GENERIC CHARACTER.

Frons filiformis, articulata, olivacea, ramis distichis vel dichotomis. Sporulæ vel nudæ, apicibus sphacellatis ramulorum inclusæ, vel in capsulis.

Frond filiform, jointed, olivaceous, with distichous or dichotomous branches. Sporules either naked and included in the sphacellated extremities of the branches, or in capsules.

SPECIFIC CHARACTER.

SPHACELLARIA racemosa; *uncialis, cæspitosa, olivacea, subrigida, fronde dichotomo; articulis diametro æqualibus; capsulis ovalibus, racemosis, pedunculatis.*

SPH. an inch in height, tufted, olivaceous, somewhat rigid, the fronds dichotomous; articulations equal in length and breadth; capsules oval, racemose, pedunculate.

SPHACELLARIA racemosa, *Grev. Fl. Edin.* p. 314.

HAB. Sea shores. Frith of Forth, opposite to Caroline Park, Dr RICHARDSON. February.

Plant tufted, about an inch in height, of an olive-green or olive-brown colour. *Frond* filiform, somewhat rigid, 3—4 times dichotomous, the dichotomies acute. *Articulations* equal in length and breadth, diaphanous to the base. *Summits* of the branches, not sphacellated in my specimens, but somewhat dilated and hyaline, as in many other species previous to the sphacellation making its appearance. *Fructification*, oval capsules, surrounded by a very narrow pellucid border, pedicellate, and arranged in a racemose manner on a common jointed peduncle. *Racemes* suberect, arising from various parts of the frond.

Sphacellaria is a genus established by LYNGBYE (the name being derived from σφάκελος, *gangræna*), to include a small group of plants comprehended by the older authors under *Conferva*, and more recently by AGARDH under *Ce-*

ramium. They certainly agree well together in habit and most other characters. They are all of an olivaceous hue, more or less rigid in substance, filamentous, cylindrical, and articulated: the articulations almost always equal or nearly so in length and breadth. The fronds are either dichotomous, or branched in a distichous manner. The fructification is of two kinds: naked granules contained in the dilated summits of the branches which are at length dehiscent; and capsules on peduncles. When the naked granules are not present, the summits of the branches are nevertheless generally somewhat dilated, hyaline or sphacellated. The capsules are surrounded with a pellucid limbus, and are produced laterally on different parts of the frond. The habit of the whole group is so peculiar, that the naked eye is generally sufficient to refer any of the species to its place. The other British species are,

Sphacellaria plumosa, Lyngb.—*Conferva pennata,* Smith, Eng. Bot. t. 2330. middle figure.

Sph. pennata, Lyngb.—*Conf. pennata,* Sm. E. B. t. 2330. upper and lower figures.—*Ceramium cirrosum,* Ag.—Hook. Fl. Scot. 2. p. 86.

Sph. scoparia, Lyngb.—*Conf. scoparia,* Sm. E. B. t. 1552.

Sph. olivacea, Grev.—*Sph. cæspitula,* Lyngb.—*Conf. olivacea,* Sm. E. B. t. 2172.

Sph. fusca. Conf. fusca, Huds.—Dillw. *Conf.* t. 95.

The present individual, though of humble growth, is inferior to none in point of beauty under the microscope; its chief attraction residing in the abundant racemose capsules. It was found by my friend Dr RICHARDSON previous to his memorable journey to the North Sea along with Captain FRANKLIN, and kindly communicated to me for description in the *Flora Edinensis.*

Fig. 1. *Tufts of Sphacellaria racemosa, nat. size.* Fig. 2. *A single frond.* Figs. 3. & 4. *Portions of the frond, with fructification.—All but* Fig. 1. *more or less magnified.*

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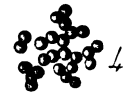

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ÆCIDIUM BERBERIDIS.

Berberry Æcidium.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *GASTROMYCI, Grev.*—EPIPHYTÆ, *Link.*

GENERIC CHARACTER.

Peridia in foliis vivis parasitica, membranacea, apice dehiscentia, ore plerumque dentato. Sporidia globosa, minutissima, libera, pulverulenta.

Peridium parasitic on living leaves, membranaceous, bursting at the apex, the mouth generally dentate. Sporidia very minute, dust-like.

SPECIFIC CHARACTER.

ÆCIDIUM Berberidis; *confertum, glomeratum, peridiis elongatis, cylindricis, aurantiacis, ore dentibus deciduis instructo, sporidiis copiosis.*

Æ. densely clustered; peridia elongated, cylindrical, orange, the mouth furnished with deciduous teeth; sporidia copious.

ÆCIDIUM Berberidis, *Gmel. Syst.* p. 1473.—*Pers. Syn. Fung.* p. 209.—*Alb. et Schwein.* p. 119.—*De Cand. Fl. Franç.* ed. 3. v. 2. p. 246.—*Ejusd. Syn.* p. 51.—*Sow. Fung.* t. 397. f. 5. (bad).—*Moug. et Nestl. Pl. Exsicc.* No. 86.—*Purt. Midl. Fl.* v. 2. p. 724.—*Schwein. Syn. Fung. Carol.* No. 437.—*Hook. Fl. Scot.* 2. p. 14.—*Grev. Fl. Edin.* p. 446.

RŒSTELIA berberidis, *Gray's Nat. Arr.* v. 1. p. 534.

LYCOPERDON poculiforme, *Jacq. Coll. Aust.* 1. p. 122. t. 4. f. 1.

HAB. On the lower surface of the leaves, the fruit-stalk, seed-vessel, calyx, and even corolla of the Common Berberry *(Berberis vulgaris)*. May—July. Frequent throughout Great Britain.

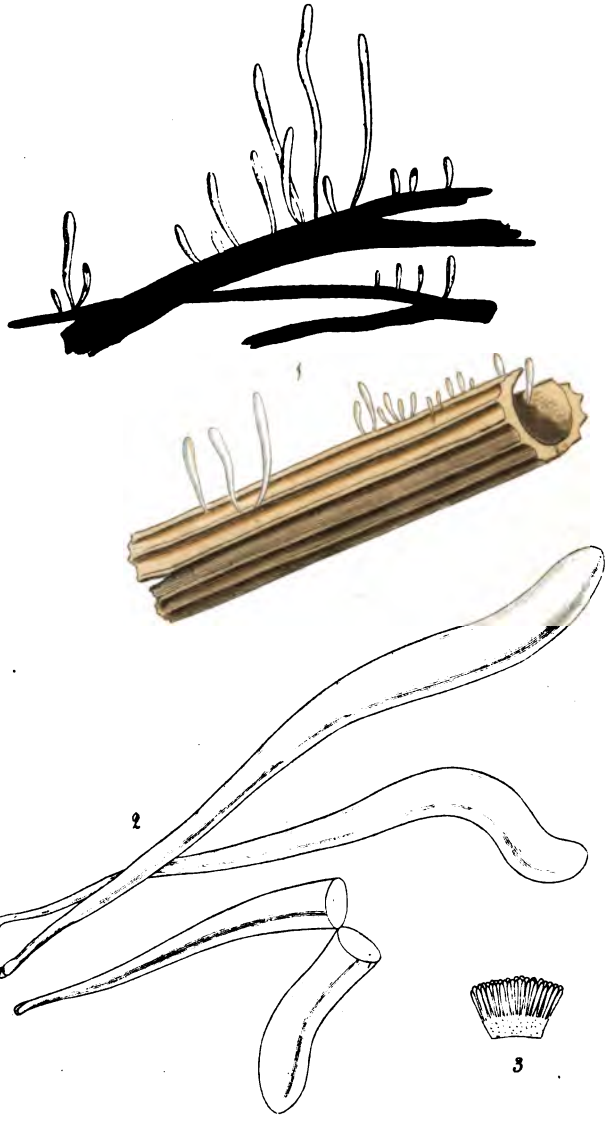
Peridia growing in dense, large or small clusters, of a fine orange colour, more or less elongated, cylindrical, the orifice somewhat paler, and furnished with irregular, white, very brittle, deciduous teeth. When the plant grows on the leaf, the upper surface is of a fine red colour; when on the calyx or seed-vessel, the parts are thickened and distorted. *Sporidia* profuse, globose, yellow under the microscope, and, if a high power is used, appearing to be reticulated.

This minute *Gastromycus* is one of the most beautiful of its tribe, and has given rise to the vulgar opinion that the neigh-

bourhood of Berberry bushes is extremely detrimental to fields of wheat. It is well known that the disease called the *Rust* in corn is highly injurious; but the colour of the rust, and that of the present plant, constitutes the only similarity between them. They belong in fact to two different genera, and of course cannot propagate each other. I have nevertheless heard creditable persons affirm, that they have seen the corn fail for a considerable space round a berberry bush, while it was strong and fertile in the rest of the field. If this is in reality owing to the Berberry (which I do not think), it must be attributed to some other cause than the parasitic plant here figured and described.

Like *Æcidium Thalictri*, already represented in this work, *Æ. Berberidis* belongs to LINK's genus *Ræstelia;* but I have already shewn that the genus *Æcidium* cannot bear division.

Fig. 1. *Æcidium Berberidis, nat. size.* Fig. 2. *A group of Peridia, with their orifices dentated.* Fig. 3. *A group of Peridia having lost their teeth.* Figs. 4. and 5. *Sporidia.—All but* Fig. 1. *more or less magnified.*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CLAVARIA UNCIALIS.

White gregarious Clavaria.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *FUNGI, Link, Grev.*

GENERIC CHARACTER.

Plantæ carnosæ, plus minusve cylindraceæ, simplices vel ramosæ. Hymenium læve, omnem fere superficiem occupans, cum stipite confluens. Sporulæ albidæ vel ochraceæ.

Carnose plants, more or less cylindrical, simple or branched. Hymenium smooth, occupying almost the whole surface, and confluent with the stipes. Sporules white or ochraceous.

SPECIFIC CHARACTER.

CLAVARIA uncialis; *alba, gregaria, clavata, teres, lævis, non fragilis, apice obtusa, ad basin nuda, valde attenuata.*

CL. white, gregarious, round, club-shaped, smooth, not fragile, rounded at the apex, below naked, much attenuated.

CLAVARIA uncialis, *Grev. Fl. Edin.* p. 415.

HAB. On the dead stems of large herbaceous plants, rotten twigs, &c. in woods. Autumn. Foxhall, near Edinburgh, Captain WAUCH.

Plant very gregarious, half an inch to one inch in height, white, becoming tinged with yellow in age, nearly straight or slightly flexuose, solid, round, not brittle, the base neither villose nor twisted, very slender, gradually incrassated upwards, and rounded at the apex. *Tubular cells* of the *hymenium* filiform.

A small species, not possessing any peculiar interest. It is, however, very distinct, and ranges near *Cl. fragilis*, *Cl. virgultorum*, and *Cl. tortilis* of PERSOON. From the first it differs, in not being brittle, never rugose, and never growing on the ground; from the second, in being incrassated upwards,

much smaller, and not villose at the base; and from the third, in the want of a dark-coloured twisted stipes.

Fig. 1. *Clavaria uncialis, nat. size.* Fig. 2. *Ditto, magnified, one plant divided.* Fig. 3. *Sporuliferous tubular cells.*

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PEZIZA ERUMPENS.

Sycamore-petiol Peziza.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. ***FUNGI, Link,*** *Grev.*

GENERIC CHARACTER.

Pileus stipitatus aut sessilis, plus minusve cupuliformis vel complanatus, tubulis elongatis sporuliferis in pagina superiore.

Pileus sessile or stipitate, dilated upwards into a variable cup-shaped or flattish receptacle, having sporules contained in elongated tubular cells, whose summits terminate at the superior surface.

SPECIFIC CHARACTER.

PEZIZA erumpens; ***minuta, ceracea, glaberrima, sessilis, cinerea, sub cortice Aceris Pseudo-Platani petiolorum subputridorum inclusa, tempestate humida solum erumpens.***

P. minute, ceraceous, glabrous, sessile, grey, concealed beneath the bark of the semiputrid petiols of Acer Pseudo-Platanus, and bursting through it only in moist weather.

HAB. On the fallen petiols of the Sycamore *(Acer* ***Pseudo-Platanus****)*, late in the autumn. Auchindenny woods, near Edinburgh.

In dry weather, nothing is perceptible but oblong or elliptical black spots, to the naked eye resembling an *Hysterium*. In moist weather, the plant makes its appearance, by gradually distending the small slit in the bark of the petiol, till it attains its round form, when the margin projects over the edge of the fissure; in the absence of moisture, the whole again contracts and becomes invisible. ***Pileus*** very minute, of a grey colour, and waxy-watery substance, glabrous, rather thin, round, entire, margin none when expanded. ***Hymenium*** slightly concave, the tubular cells filiform.

The present new species of *Peziza* was discovered wholly by accident. I had brought home the petiols of the Sycamore from Auchindenny woods, under the persuasion that the plants upon them were probably an undescribed species of *Hysterium*.

On immersing them in water, however, previous to examination, I was surprised, in the course of a few minutes, to see them plentifully covered with the *Peziza* represented in the annexed plate: the reader is there shewn at Fig. 1. the appearance produced both in a dry and moist state on the same petiol; and at Fig. 2., the gradual evolution on the application of moisture.

Peziza erumpens belongs to the third series PHIALLA in the System of FRIES, and to the third (?) section of the eleventh Tribe, CERACELLÆ, *Sessiles, subtus liberæ et puncto centrali adfixæ, tenues, aquoso-ceraceæ, molles, submembranaceæ.*

The sporuliferous cells or tubes, were sufficiently visible on dissection, but I was not able to detect sporules.

Fig. 1. *Plants, both concealed and evolved, nat. size.* Fig. 2. *Shows their gradual evolution.* Fig. 3. *A plant divided.* Fig. 4. *Tubular sporuliferous cells.—All but* Fig. 1. *more or less magnified.*

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GRIMMIA TRICHOPHYLLA.

Flexuose, slender-leaved Grimmia.

CLASS AND ORDER CRYPTOGAMIA MUSCI, *Linn.*—NAT. ORD. *MUSCI, Juss. &c.*

GENERIC CHARACTER.

Seta terminalis. Peristomium simplex e dentibus 16, *integris vel perforatis (rarissime fissis) æquidistantibus. Calyptra mitriformis.*—Hook.

Seta terminal. Peristome simple, of 16 entire or perforate (rarely cleft) equidistant teeth. Calyptra mitriform.

SPECIFIC CHARACTER.

GRIMMIA trichophylla; *caule elongato; foliis lanceolato-subulatis, carinatis, margine recurvato, apice pilifero; seta curvato-flexuosa; theca ovato-elliptica, sulcata, operculo rostrato.*

GR. stem elongated; leaves lanceolato-subulate, carinate, margin recurved, the apex piliferous; seta curved and flexuose; theca ovate-elliptical, sulcate, operculum rostrate.

GRIMMIA trichophylla, *Grev. Fl. Edin.* p. 235.

HAB. On stone-walls in Scotland. Arthur's Seat, and coast of Fife; Mr WALKER ARNOTT. Walls on the road side between Dunkeld and Blair in Athole, frequent; Messrs HOOKER and GREVILLE. By the road side between Edinburgh and Ravelrig Toll, about seven miles from the former place.

Plants broadly tufted. *Stems* branched, rather slender, half an inch to one inch long or more. *Leaves* lanceolate-subulate, carinate, and recurved at the margin, gradually terminating in a diaphanous hair-like point, which varies in length, and gives a hoary appearance to the plant. *Seta* curved and flexuose, nearly a quarter of an inch long. *Thecæ* numerous, ovate-elliptical, varying from pale yellowish to reddish-brown, the mouth contracted, and furnished with an *annulus*. *Lid* small, orange, with a rostrate beak. *Peristome* of 16 equidistant teeth, perforated, and often slightly cleft at the apex.

When I had first the good fortune to discover this moss, I suspected it to be a variety of *Trichostomum patens*, or at least

of that state of it named *Trichostomum funale* by SCHWÆGRICHEN. In this supposition I considered myself subsequently mistaken; but the opinion of my learned friend Professor HOOKER again led me to my first conclusion. We had neither of us, however, examined the peristome, which proved, after all, to be that of a true *Grimmia*. The above detail will contribute to shew, how strongly with the fructification of a *Grimmia*, the habit of a *Trichostomum* is united; the two genera are indeed brought nearer than ever to each other in this plant, which may be said to terminate *Grimmia* on the one hand, while *Trichostomum funale* commences the genus to which it belongs on the other. Among the British species, the peristome of *Grimmia trichophylla* approaches nearest to that of *Gr. pulvinata*, and its leaves to those of *Gr. ovata*.

In the same excursion in which we found the present Moss between Dunkeld and Blair in Athole, it will gratify the British bryologist to learn, that Dr HOOKER, Mr WALKER ARNOTT and myself, added *Dicranum Schreberianum* to our Flora, and discovered *Weissia nigrita* in tolerable plenty, as well as that great rarity *Weissia splachnoides;* added to which, *Splachnum tenue* grew in profusion. A few weeks before, Mr WALKER ARNOTT had added to the British list of Musci *Hypnum dimorphum* of BRIDEL.

Fig. 1. *Grimmia trichophylla, nat. size.* Fig. 2. *A single plant.* Fig. 3. *Theca.* Fig. 4. *An upper leaf.* Fig. 5. *A lower leaf.* Fig. 6. *Calyptra.* Fig. 7. *Portion of the peristome.—All but* Fig. 1. *more or less magnified.*

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SCLEROTIUM SUBTERRANEUM.

Orange Sclerotium.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *GASTROMYCI? Link, Grev.*

GENERIC CHARACTER.

Massa subglobosa aut difformis, intus homogenea, vesiculosa, carnosa, vel cornea. (Sporulæ incognitæ.)

A subglobose or shapeless mass, within homogeneous, vesiculose, fleshy or corneous. (Sporules have not been discovered.)

SPECIFIC CHARACTER.

SCLEROTIUM subterraneum; *gregarium, spongiosum, rotundatum sed valde inæquale quandoque lobatum; colore omnino aureo-flavo vel albido.*

Sc. gregarious, spongy, rounded but very unequal, sometimes lobed; colour wholly orange-yellow or whitish.

SCLEROTIUM subterraneum, *Tode, Meckl. Fung.* 1. p. 3. t. 1. f. 5.—*Alb. et Schwein.* p. 73.—*De Cand. in Mém. du Mus.* v. 2. p. 401. No. 3.—*Grev. Fl. Edin.* p. 461.

SCLEROTIUM Muscorum, *Pers. Syn. Fung.* p. 120.—*Schwein. Syn. Fung. Carol.* No. 308.

HAB. Attached to the roots or decaying stems of mosses, or on dead wood and roots of trees beneath the surface of the soil. Summit of Ben-Reishapol, W. C. TREVELYAN, Esq. On various Highland mountains, chiefly growing on *Trichostomum lanuginosum.* Between Newhaven and Caroline Park, near Edinburgh, on *Hypnum squarrosum.* Autumn.

Aggregated, rounded, extremely irregular, tuberculated or lobed, fine orange, yellowish or whitish; of a spongy yet firm substance, solid, homogeneous throughout, and of a similar colour; varying in size from 1 line or less to 4 or 5 lines in diameter, the whitish variety being the largest.

This species of *Sclerotium* is probably of frequent occurrence, but has not been often observed either in this country or on the Continent. Its peculiar place of growth is sufficient to account for the paucity of information concerning it. In the neighbourhood of Edinburgh, I have repeatedly met with it,

attached to the lower part of the half-rotten stems of mosses; but the finest specimens I have yet seen, were collected by Mr W. C. TREVELYAN on the very summit of one of the Highland mountains, amidst the thick masses of *Trichostomum lanuginosum*, with which such localities so frequently abound.

The white variety I have never observed in this country.

Fig. 1. *Sclerotium subterraneum, nat. size, on Trichostomum lanuginosum.* Fig. 2. *Plants magnified.* Fig. 3. *A plant divided; and,* Fig. 4. *A thin slice, both also magnified.*

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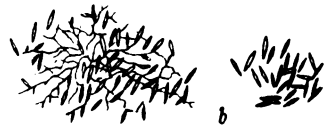

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FUSIDIUM GRISEUM.

Grey Fusidium.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *BYSSOIDEÆ, Grev.*—EPIPHYTÆ, *Link.*

GENERIC CHARACTER.

Thallus plano-effusus, minutissimo-floccosus. Flocci ramosi, breves. Sporidia inspersa, libera, fusiformia, non septata.

Plant plane, effused, minutely filamentous. Filaments short, branched, Sporidia scattered, free, fusiform, not divided.

SPECIFIC CHARACTER.

FUSIDIUM griseum; *thallus colore griseo.*

F. plant of a grey colour.

FUSIDIUM griseum, *Ditmar, in Sturm's Deutschl. Fungi*, t. 17.—*Link, in Berl. Mag.* v. 3. p. 8.—*Gray's Nat. Arr.* v. 1. p. 544.—*Grev. Fl. Edin.* p. 464.

HAB. On dead leaves, chiefly those of the Beech and Oak. Autumn to spring. About Edinburgh.

Thallus or mass of filaments, forming effused, irregular, flat, whitish or grey spots, 1–5 lines broad, and very thin. *Filaments* very short, but under a pocket magnifier, appearing to be rather compact. *Sporidia* fusiform, pellucid, not divided, free, and scattered among the filaments.

Fig. 1. *a, Fusidium griseum, on Beech leaves, nat. size. b, Filaments and Sporidia magnified.*

FUSIDIUM FLAVO-VIRENS.

Yellow Fusidium.

SPECIFIC CHARACTER.

FUSIDIUM flavo-virens; *thallus colore flavo.*

F. plant of a yellow colour.

FUSIDIUM flavo-virens; *Ditmar, in Sturm's Fungi*, t. 18.—*Grev. Fl. Edin.* p. 464.

Fusidium æruginosum, *Link, in Berl. Mag.* v. 3. p. 8.?—*Gray's Nat. Arr.* v. 1. p. 544.?

Hab. On dead leaves of the Oak, Beech, Spanish Chesnut, &c. Winter and spring. About Edinburgh.

Thallus plane, effused, 1–5 lines broad or more, very irregular, less compact than the preceding, of a fine yellow or greenish-yellow colour. *Filaments* short, somewhat entangled. *Sporidia* fusiform, scattered, pellucid, not divided.

The two plants here described, are so similar in almost every respect except colour, that they might reasonably be considered as varieties of the same species, were not colour an object of primary importance in individuals of so simple an organization. In the present instance, that character is very striking. It does, indeed, seem to appear, that Nature bestows on the lower vegetable forms of her kingdom more permanently constant hues, as some compensation for the humble station assigned to them,—or, what amounts to the same thing, that their chemical constitution is such as to admit at the same time of an endless variety of tints, and of those tints being preserved so faithfully, as to admit of their forming excellent specific characters.

It is difficult to conceive how Mr Gray could have fallen into the radical error of placing *Fusidium* under *Stilbosporideæ*, with the character of *Sporidia many-celled.*

I do not concur with the acute Link in excluding this genus from the *Byssoideæ*, as filaments are distinctly visible even under a pocket lens.

Fig. 2. *a, Fusidium flavo-virens, nat. size. b, Filaments and Sporidia, magnified.*

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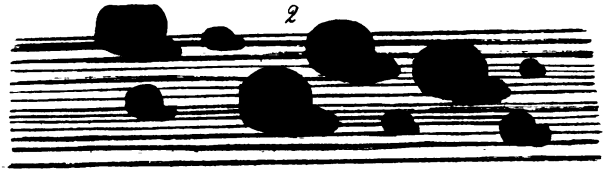
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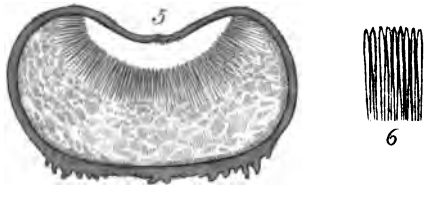
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HETEROSPHÆRIA Patella.

Collapsed Heterosphæria.

Class and Order CRYPTOGAMIA FUNGI, *Linn.*—Nat. Ord. *HYPOXYLA*, *De Cand. Grev.*

GENERIC CHARACTER.

Receptaculum 0. *Thecæ vel tubulæ sporuliferæ fixæ, erectæ, persistentes, sphærulis coriaceis vel corneis indehiscentibus inclusæ.*

Receptacle 0. Thecæ, or sporuliferous tubes, fixed, erect, persistent, inclosed in coriaceous or corneous indehiscent spherules.

SPECIFIC CHARACTER.

Heterosphæria Patella.

Sphæria Patella, *Pers. Syn. Fung.* p. 76.—*Moug. et Nestl. St. Exsicc.* No. 485. *Hook. Fl. Scot.* 2. p. 7.—*Schwein. Syn. Fung. Carol.* No. 189.

Sphæria? Patella, *Grev. Fl. Edin.* p. 353.

Sphæria nigra, *Purt. Midl. Fl.* v. 3. p. 489. (*not of* v. 2. p. 710. *or of Sow.* t. 393. f. 1.)

Hab. On the dead stems of large herbaceous plants, especially the *Umbelliferæ*. Autumn to spring. Very frequent.

Receptacle none. *Spherules* sessile, closely attached to the surface on which they grow, black, coriaceous, subglobose, striate or even plicate towards the summit, which, in very moist weather, is plane, but, when dry, quickly becoming depressed, collapsed and concave, with a very rounded margin. Centre not papillose, and not dehiscent. The *interior* is nearly filled with a gelatinous mass, terminated above with a stratum of fixed sporuliferous, pellucid tubes or thecæ, which form a concave line corresponding to the concavity of the spherule: when, however, in consequence of moisture, the spherule is distended, there is a cavity produced between the summits of the thecæ and the upper part of the spherule, which explains the rapidity with which the spherule collapses when the moisture is removed. The *Sporules* I have not observed, though the tubes which no doubt contain them are very obvious.

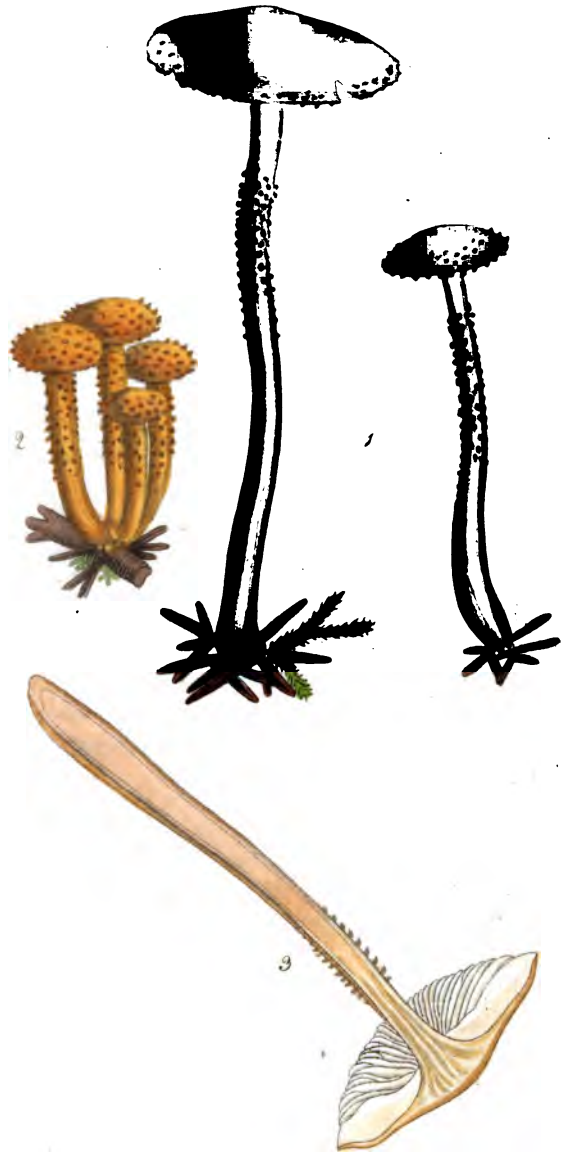
It is surprising to find, that, with a character so well marked, how little the subject of the present plate has been noticed. I believe Persoon to have been the first who de-

scribed it, though he imagined TODE had figured it under the name of *penetrans*. Whatever that plant may prove which TODE called *Sphæria penetrans*, it assuredly cannot be *Sphæria Patella* of other authors. What are his own words? "Minimis sui generis merito associatur, cum puncto paulo major appareat. Capsulæ nigræ, læves, nitidæ, globosæ, vertice acuminato, pondere mucilaginis, in guttulæ formam expressæ et postea in globulum, omnis nitoris expertem, coagulatæ, deprimuntur adeo, ut tandem in Patellæ formam excaventur; globulis ipsis tum decidentibus." This *globulus*, or "globus spermaticus," does not belong to our plant, which also seems to be much larger than that figured by TODE.

Another proof how much this plant has been misunderstood, is, that DE CANDOLLE, in his *Synopsis Fl. Gall.* has described *Sphæria Herbarum* under the name of *Sph. Patella*, and corrected himself in the Supplement to the *Flore Française*. And an additional proof is, that Mr PURTON has cited *Sph. Patella* as a synonym to *Sphæria nigra* of SOWERBY, which is certainly not the plant, and probably a variety of *Sphæria Herbarum*. Mr PURTON, however, finds his specimens agree with those of MOUGEOT and NESTLER,—a circumstance which proves his plant to be correct, though not his reference to SOWERBY.

The peculiar characters of this plant are quite sufficient to warrant its formation into a new genus.

Fig. 1. *Heterosphæria Patella, nat. size.* Fig. 2. *Plants magnified.* Fig. 3. *Plants removed.* Fig. 4. *A section.* Fig. 5. *A sectional thin slice.* Fig. 6. *Sporuliferous tubes.—All magnified except* Fig. 1.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AGARICUS GRANULOSUS.

Small yellow scaly Agaric.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *FUNGI, Link, Grev.*

DIV. LEUCOSPORUS LEPIOTA, *Fries.*—SECT. I. LEPIOTA, *Pers.*

GENERIC CHARACTER.

Pileus stipitatus aut latere affixus, subtus lamellis sporuliferis, rectis, simplicibus. Volva nulla.

Pileus furnished with a stipes, or fixed by its side, bearing on the under surface, straight, simple, sporuliferous lamellæ. Volva none.

SPECIFIC CHARACTER.

AGARICUS granulosus; *parvus, solitarius vel subcæspitosus; pileo plerumque flavo-aurantiaco furfuraceo-squamoso, lamellis albidis, adfixis; stipite subsolido, infra annulum patulum squamoso.*

AG. small, solitary, or somewhat tufted; pileus mostly orange-yellow, with furfuraceous scales: lamellæ whitish, fixed; stipes subsolid, scaly below the spreading annular veil.

AGARICUS granulosus, *Pers. Syn. Fung.* p. 264.—*Alb. et Schwein.* p. 147.—*Schwein. Syn. Fung. Carol.* No. 560.—*Grev. Fl. Edin.* p. 370.—*Fries, Syst.* v. 1. p. 24.

AGARICUS ochraceus, *Bull. Champ.* p. 644. t. 362. 530. f. 3.—*De Cand. Fl. Franç.* v. 2. p. 204.—*Ejusd. Syn.* p. 42.

AGARICUS croceus, *Bolt. Fung.* t. 51. f. 2. (*very bad*).—*With. Bot. Arr.* ed. 6. v. 4. p. 248.—*Sow. Fung.* t. 19.—*Relh. Fl. Cantab.* ed. 3. p. 526.—*Purt. Midl. Fl.* v. 2. p. 634. et v. 3. p. 405.

AGARICUS amianthus, *Scop. Fl. Carniol.* p. 434.

AGARICUS muricatus, *Fl. Dan.* t. 1015.

AGARICUS fimbriatus, *Schum. Sælland.* p. 261. *teste Fries.*

AGARICUS flavo-floccosus, *Batsch. Elench. Fung.* t. 19. f. 97.

Variety with a red pileus.

AGARICUS carcharias, *Pers. Syn.* p. 263.—*Ejusd. Icon. Fung.* t. 5. f. 1–3.

AGARICUS albo-marginatus, *Schum.* l. c. *fide Fries.*

Variety with a whitish pileus.

AGARICUS lanuginosus, *Fl. Dan.* t. 1248. f. 1.

LEPIOTA granulosa, *Gray's Nat. Arr.* v. 1. p. 602.

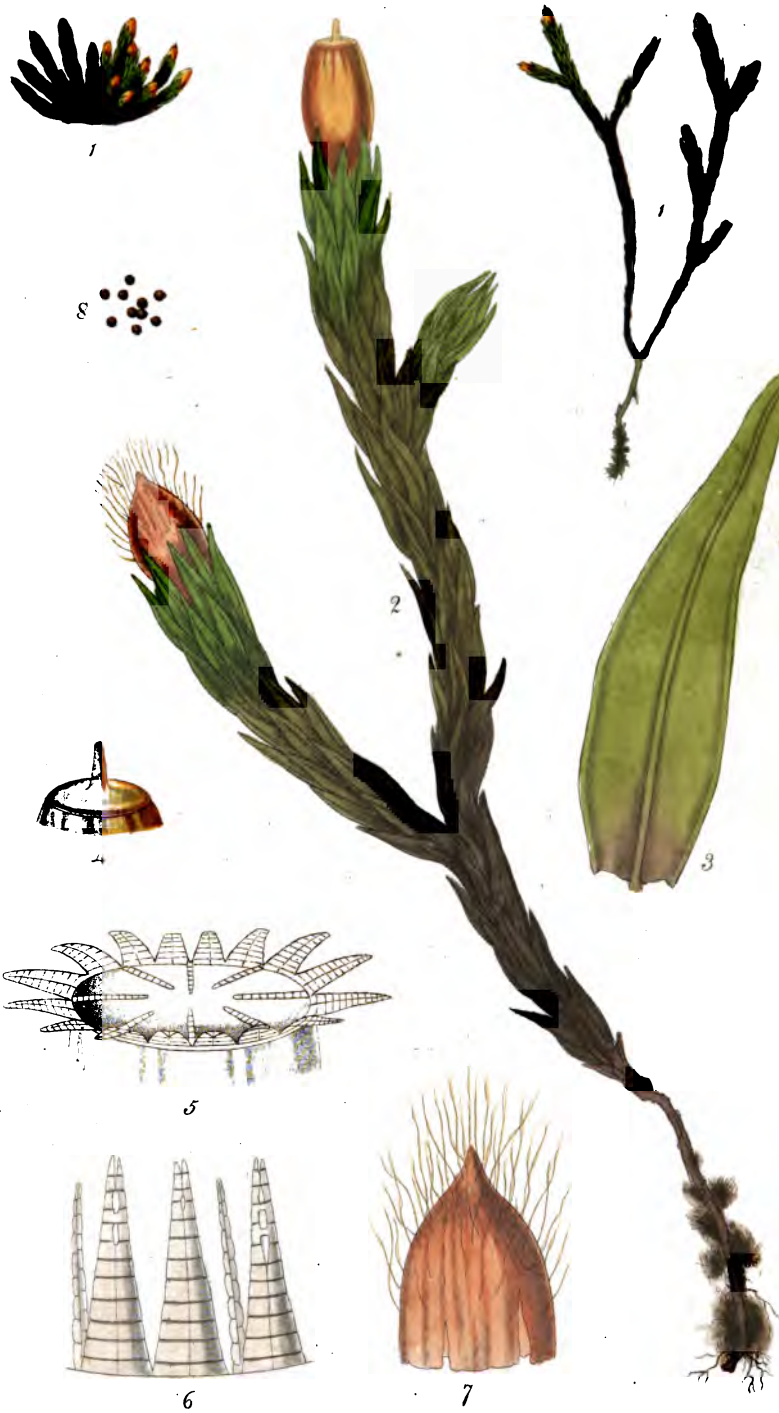
MONOMYCES exilis, *Batt. Fung.* p. 45. t. 20. f. H.

HAB. In woods, among mosses, frequently attached to rotting wood, especially stumps of old Fir trees. Autumn, frequent.

Plant gregarious, solitary or subcæspitose. *Pileus* convex, at length nearly plane, but generally more or less obtusely umbonate, 1–2 inches broad, the apex mostly smooth, but the rest furfuraceous, with small, often reflexed scales: the *Colour* mostly orange-yellow, but sometimes with a red tinge, very rarely nearly white. *Flesh* thin, white. *Lamellæ* rather numerous, whitish, adnate with the stipes, becoming tinged with yellow in age. *Stipes* 2–4 inches high, 2–4 lines thick, rarely with any cavity unless at the top, nearly straight, firm, thicker at the base, and rough from the annulus downwards, with spreading scales. *Annulus* irregular, somewhat fugitive, or at least losing its form.

Agaricus granulosus is a species liable to considerable variety in size and colour, as the synonymes sufficiently prove. In the annexed figure, I have represented the most common appearance exhibited by it in this country, in colour as well as magnitude. Those specimens delineated by SOWERBY, approach some of the continental varieties, but are still very characteristic. It is one of our most beautiful species, the regularity of the little scales giving the plant a peculiarly neat appearance. By drying it with slight pressure, it preserves extremely well, and retains its main characters.

Fig. 1. *Solitary plants.* Fig. 2. *A tuft of half-grown plants.* Fig. 3. *A mature plant divided longitudinally.—All nat. size.*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ORTHOTRICHUM RUPINCOLA.

Funck's Rock Orthotrichum.

CLASS AND ORDER CRYPTOGAMIA MUSCI, *Linn.*—NAT. ORD. *MUSCI, De Cand. Hook. &c.*

GENERIC CHARACTER.

Seta terminalis. Peristomium plerumque duplex ext. e dentibus 16 *per paria approximatis; int. e ciliis* 8–16 *vel nullis. Calyptra mitriformis. Columella non capitata.*

Seta terminal. Peristome mostly double; ext. one of 16 teeth, approaching in pairs; int. one of 8–16 ciliary processes, or wanting. Calyptra mitriform. Columella not capitate.

SPECIFIC CHARACTER.

ORTHOTRICHUM rupincola; *foliis erectis, rigidis, late lanceolatis; theca subimmersa, apicem versus striata; operculo plano, rostrato; peristomio e dentibus* 16, *et ciliis* 8, *calyptra valde pilosa.*

O. leaves erect, rigid, broadly lanceolate; theca somewhat immersed, striate towards the mouth; lid plane, rostrate; peristome of 16 teeth, and 8 ciliary processes; calyptra very hairy.

ORTHOTRICHUM rupincola, *Funck, Deutschl. Moose,* p. 35.—*Grev. Fl. Edin.* p. 249.—*Hook. et Tayl. Musc. Brit.* ed. 2. *MSS.*

HAB. Rocks. King's Park, Edinburgh, Mr WALKER ARNOTT. Banks of the river Clyde, Mr M. STARKE. Walls near Forfar, abundantly, Mr DRUMMOND. Auchindenny woods; Castle Hill, Stirling, abundant; rocks and stone-walls about Callander and Lochearn-head, frequent. May to July.

Plant tufted, of a brown or even blackish colour, except the summits of the branches. *Stems* half an inch to 2 inches in length, branched, ascending, sometimes almost horizontal. *Leaves* rigid, erect, carinate, broadly lanceolate, with a strong nerve reaching to the point, the margin entire, recurved. *Theca* somewhat immersed, with a very short seta, ovate, reddish-brown, even, except near the mouth, where it is striate. *Peristome* of 16 spreading, distinct teeth, not arranged in pairs, marked with a longitudinal line, and frequently more or less lacunose or perforated towards the apex, or even slightly bifid. *Ciliary processes* 8, arising from the side of every second tooth. *Lid* reddish, flat at the base, with a straight beak. *Calyptra* widely campanulate, fulvous-yellow, very hairy.

How widely this nearly new moss is distributed in Scotland, may be perceived by the annexed stations, all of which have been ascertained in the course of a few months. That communicated by Mr DRUMMOND arrived just in time to be recorded; and it is with infinite pleasure that I assure the native botanist, he will recognise in that individual a worthy successor to the late industrious GEORGE DON. In Muscology alone, he has been eminently successful, having added to our British Flora *Neckera pennata*, *Didymodon glaucescens*, and *Timmia megapolitana* (?); besides discovering a second station for that very rare moss *Gymnostomum Donianum*.

Orthotrichum rupincola approaches most nearly to *O. affine*, but differs from it in the following characters;—the leaves are more rigid and erect, of a much blacker colour; the teeth of the peristome are not approximated in pairs, and scarcely ever revolute. The lid, "which is short, is flat at the base, with the beak suddenly set on, and of a reddish-brown colour; whereas in *O. affine* it tapers gradually into the beak, and is of a yellowish-white colour," (HOOK. *in litt.*) The *theca*, though striate near the mouth, is destitute of those decided furrows so conspicuous in that of *O. affine*. The *calyptra* of our moss is also remarkable for its deeper colour, and widely campanulate form. In general habit and colour, *O. rupincola* somewhat resembles *O. Hutchinsiæ* and *O. anomalum*, but is generally larger and more robust than either.

Fig. 1, 1. *Plants, nat. size.* Fig. 2. *A single plant.* Fig. 3. *A leaf.* Fig. 4. *The lid, not removed from the theca.* Fig. 5. *View of the Peristome.* Fig. 6. *Portion of the peristome.* Fig. 7. *Calyptra.* Fig. 8. *Sporules.—All but* Fig. 1. *more or less magnified.*

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LYCOGOLA ARGENTEA.

Large silvery Lycogola.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *GASTROMYCI, Link, Grev.*

GENERIC CHARACTER.

Plantulæ (sporangia) sessiles, globosæ vel difformes, prima ætate subfluidæ. Peridium simplex, fragile, irregulariter rumpens. Sporulæ filamentis paucis intermixtæ.

Small plants (sporangia) sessile, globose or irregular, at first almost fluid. Peridium simple, fragile, variously bursting. Sporules intermixed with a few filaments.

SPECIFIC CHARACTER.

LYCOGOLA argentea; *submagna, lævis, ovato-depressa vel rotundata, fragilissima, argentea; sporulis globosis, fusco-purpureis valde copiosis.*

L. rather large, smooth, ovate and depressed, or roundish, very fragile, silvery white; sporules globose, purplish-brown, very copious.

LYCOGOLA argentea, *Pers. Disp. Meth. Fung.* p. 7.—*Ejusd. Syn.* p. 157.—*Albert et Schwein.* p. 85.—*De Cand. Fl. Franç.* ed. 3. v. 2. p. 262.—*Ejusd. Syn.* p. 55.—*Schwein. Syn. Fung. Carol.* No. 352.—*Hook. Fl. Scot.* 2. p. 11.—*Gray's Nat. Arr.* v. 1. p. 568.—*Grev. Fl. Edin.* p. 453.

LYCOGOLA griseum majus, *Mich. Gen. Pl. Nov.* p. 216. t. 95. f. 1.

RETICULARIA Lycoperdon, *Bull. Champ.* p. 95. t. 446. f. 4. et t. 476. f. 1.—*Sow. Fung.* t. 272.—*Relh. Fl. Cantab.* ed. 3. p. 567.—*With. Bot. Arr.* ed. 6. v. 4. p. 459.—*Winch, Bot. Guide,* v. 2. p. 107.—*Purt. Midl. Fl.* v. 2. p. 704. et v. 3. p. 484.

LYCOPERDON fuscum, *Huds. Fl. Angl.* v. 2. p. 645.

MUCOR lycogolus, *Bolt. Fung.* t. 133. (*very bad*).

MUCOR carneus, *Schæff. Fung.* t. 195. f. 3.

HAB. On rotten wood, trunks of trees, dead masses of leaves and sticks, &c. not unfrequent throughout the kingdom. Autumn.

Sporangium mostly of an ovate form, and considerably depressed, but at other times roundish, half an inch to two inches broad, pulpy at first, and even fluid within, at length dry, membranaceous, remarkably fragile, and filled with a prodigious quantity of purplish-brown globose sporules, intermixed with a few filaments. *Colour* white, with a silvery lustre, at length brownish. *Dehiscence* extremely irregular, often in wide and long cracks.

The present species is the largest of the genus, and not liable to be confounded with any other, unless it be the *Lycogola turbinata* of PERSOON, figured by BULLIARD as a variety of our plant, (*Champ.* t. 476. f. 2.) It is much less, and of a pyriform shape, or attenuated below into a very short stipes. If BULLIARD has represented it correctly, growing erect, it is probably distinct, as the different forms of *Lycogola argentea* are chiefly derived from situation. When growing on a horizontal surface, which is most commonly the case, it is depressed and broad; when produced on the perpendicular trunk of a tree, or an old paling, the young semi-fluid plant naturally assumes a rounder shape, from mere gravitation.

I know few plants more fragile than the present individual, which requires therefore the utmost care in its removal. The quantity of sporules is so truly astonishing, that the rest of the plant may be regarded as nothing more than a receptacle. A part of SOWERBY's lower figure was coloured by means of the sporules.

Fig. 1. *Lycogola argentea, nat. size.* Fig. 2. *A ruptured plant.* Fig. 3. *Sporules and filaments, magnified.*

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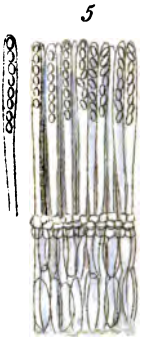
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PEZIZA VESICULOSA.

Large bladder-like Peziza.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *FUNGI, Link, Grev.*—Part of FUNGI of Authors.

GENERIC CHARACTER.

Pileus stipitatus aut sessilis, plus minusve cupuliformis vel complanatus, tubulis elongatis sporuliferis in pagina superiore.

Pileus sessile or stipitate, more or less cup-shaped or flattish, with tubular elongated sporuliferous cells in the upper surface or disk.

SPECIFIC CHARACTER.

PEZIZA vesiculosa; *magna, integra, sessilis, globoso-turbinata ore connivente, demum campanulata lacerato-crenata, dilute fuscescens, extus subfurfuracea, pallida.*

P. large, entire, sessile, globoso-turbinate with the orifice connivent, at length campanulate, lacerato-crenate, dilute brown, the exterior subfurfuraceous and pale.

PEZIZA vesiculosa, *Bull. Champ.* p. 270. (var. 2.?) t. 457.—*Sow. Fung.* t. 4. (*very good.*)—*Pers. Syn. Fung.* p. 641.—*Ejusd. Mycol. Europ.* p. 228.—*With. Bot. Arr.* ed. 6. v. 4. p. 423.—*Relh. Fl. Cantab.* ed. 3. p. 558.—*Fries, Syst. Mycol.* v. 2. p. 52.—*Hook. Fl. Scot.* 2. p. 33.—*Purt. Midl. Fl.* v. 2. p. 687. et v. 3. p. 461.—*Grev. Fl. Edin.* p. 419.

PEZIZA alutacea, *Albert. et Schwein.* p. 310.—*Schwein. Syn. Fung. Carol.* No. 1166.?

PEZIZA turbinata, *Pers. Syn.* p. 636.—*Nees' Syst.* t. 38. f. 257.

PEZIZA lycoperdoides, *De Cand. Fl. Franç.* ed. 3. v. 2. p. 87. (*in part.*)—*Ejusd. Syn.* p. 18.

PEZIZA coronata, *Batsch. Elench. Fung.* p. 121.

PEZIZA incisa, *Pers. Mycol.* 1. p. 230.

PEZIZA Marsupium, *Pers. Syn. Fung.* p. 640.—*Ejusd. Mycol.* 1. p. 228.

SCODELLINA vesiculosa, *Gray's Nat. Arr.* v. 1. p. 669.

HELVELLA vesiculosa, *Bolt. Fung.* t. 175. (*very bad.*)

FUNGOIDES pyri inversi forma, &c. *Mich. Nov. Gen. Pl.* p. 207. t. 86. f. 2.

HAB. On dunghils, old thatched roofs, heaps of rotten leaves, &c. frequent in spring and autumn.

Plant, when young, globose, the orifice very connivent, gradually becoming turbinate, and the mouth widening, at length campanulate, and the margin irregularly lacerato-crenate; 1–3 inches or more in diameter, and

nearly as much in height. *Hymenium* dilute yellowish or olivaceous-brown, often rugose, the outer surface whitish towards the lower half, and either nearly glabrous or furfuraceous. *Substance* rather thick, brittle, fleshy and full of moisture, often dividing into two plates, with an internal cavity at the base; but this is not so constant as to render it a specific character. *Sporules* oval, 8 in each tubular cell.

This large and common, but very handsome species, is liable to considerable variation. FRIES has two main varieties, and under the first, the following five subvarieties:

Coriaria, albido-fuliginea, repando-diffusa, subpalmaris.
Saccata, gigantea, margine varie incisa, intus colliculoso-costata.
Undulata, minor, firmior, regularis, extus æqualiter undulata.
Isochroa, minor, cæspitosa, sessilis, tota alba, glabra, integerrima, (*Pers.*)
Minor, fuligineo-pallens, margine crenata, basi applanata, (vere in fimo locis udis abunde.)

Var. β of FRIES (*P. Marsupium* of PERSOON) is greyish-white, subglabrous, and remarkable from growing on the ground in shady woods. Mr PURTON, in his Midland Flora, has also referred PERSOON's plant to *P. vesiculosa*.

The specimens represented in the annexed plate, were collected on dunghils in the new Edinburgh Botanic Garden, and differ from those so admirably figured by SOWERBY, in being almost quite glabrous on their external surface, but, like his, possessed a cavity in the substance at the base, and were separable into two plates.

Fig. 1. *A full sized and mature plant.* Fig. 2. *A group of young plants.* Fig. 3. *A section.* Fig. 4. *A thin vertical slice of the inner plate, including the hymenium.* Fig. 5. *Tubular sporuliferous cells.* Fig. 6. *Sporules.—The three last figures magnified.*

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b

SPOROTRICHUM MINUTUM.

Minute white Sporotrichum.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *BYSSOIDEÆ, Grev.*—MUCEDINES, *Link.*

GENERIC CHARACTER.

Thallus cæspitosus vel effusus. Fila ramosa, implexa, sporidiis simplicibus globosis aut ovalibus vage inspersis.

Thallus tufted or effused. Filaments branched, entangled. Sporidia simple, globose or oval, scattered without order among the filaments.

SPECIFIC CHARACTER.

SPOROTRICHUM minutum; *thallus subrotundus, minutus, candidus, filis laxe intricatis, sporidiis ovalibus, numerosis, candidis.*

Sp. thallus roundish, minute, very white, the filaments loosely interwoven; sporidia oval, numerous, white.

SPOROTRICHUM minutum, *Grev. in Wern. Trans.* v. 4. p. 68. t. 5. f. 1.—*Ejusd. Fl. Edin.* p. 464.

HAB. On dung and putrid substances. Autumn and winter. Braid Hermitage.

Tufts distinct, about half a line broad, roundish, at length contiguous, rarely confluent, very white. *Filaments* lax, not much branched, jointed, pellucid. *Sporidia* numerous, oval, large for the size of the plant.

With this species, no one described either by LINK in his Monograph, or by PERSOON in *Mycologia Europæa*, can be confounded. The oval sporidia are alone sufficient to distinguish it; all the other species of a white colour, and tufted form, have globose ones.

Fig. 1. a, *Sporotrichum minutum, nat. size.* b, *Filaments and sporules, magnified.*

SPOROTRICHUM SULPHUREUM.

Sulphur-coloured Sporotrichum.

SPECIFIC CHARACTER.

SPOROTRICHUM sulphureum; *thallus cæspitosus, rotundatus, sulphureus, filis laxe intricatis; sporidiis numerosis, globosis, sulphureis.*

SP. thallus tufted, rounded, sulphur-coloured, the filaments loosely interwoven; sporidia numerous, globose, yellowish.

SPOROTRICHUM sulphureum, *Grev. in Wern. Trans.* v. 4. p. 69. t. 5. f. 3.—*Ejusd. Fl. Edin.* p. 465.

HAB. On dung, damp wood, &c. Also on damp corks and other substances in vaults and cellars. Frequent at all seasons in Edinburgh.

Tufts half a line to 2 lines broad, irregular in form, mostly roundish, of a pale yellow or sulphur colour; distinct, at length sometimes confluent. *Filaments* branched unequally, often abruptly jointed. *Sporidia* globose, small, numerous, sulphur-coloured.

I have not been able to find any described species answerable to the present individual, which, from its colour, is sufficiently striking at first sight. The *Byssoideæ* deserve to be more studied, not only from the intrinsic beauty of the greater number, but from the satisfactory characters which these plants, small as they are, furnish to an accurate observer.

Fig. 2. a, *Sporotrichum sulphureum, nat. size.* b, *Filaments and sporules.*

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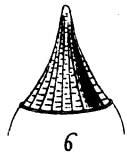
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NECKERA PENNATA.

Feather-like Neckera.

CLASS AND ORDER CRYPTOGAMIA MUSCI, *Linn.*—NAT. ORD. *MUSCI, Juss. De Cand. Hook.* &c.

GENERIC CHARACTER.

Seta lateralis. Peristomium duplex; ext. e dentibus 16, *erectis, liberis; int. e ciliis totidem cum externis alternantibus,* (HOOK.)

Seta lateral. Peristome double; outer one of 16 erect, free teeth; inner one of as many ciliary processes, placed alternately with the outer teeth.

SPECIFIC CHARACTER.

NECKERA pennata; *caule decumbente, ramoso; foliis bifariis, ovato-lanceolatis, transversim undulatis, apice serrulato; theca ovata, subsessilis, perichætio immerso.*

N. stem decumbent, branched; leaves bifarious, ovato-lanceolate, transversely undulate, serrulate at the point; theca ovate, subsessile, concealed by the perichætial leaves.

NECKERA pennata, *Hedw. St.* v. 3. t. 19.—*Ejusd. Sp. Musc.* p. 200.—*Web. et Mohr, Bot. Tasch.* p. 239.—*De Cand. Fl. Franç.* ed. 3. v. 2. p. 543.—*Ejusd. Syn.* p. 111.—*Schultz, Fl. Starg.* p. 306.—*Schwaeg. Suppl.* 2. p. 144.—*Mich. Fl. Am. Bor.* v. 2. p. 307.—*Moug. et Nestl. St. Exsicc.* No. 146.—*Brid. Musc. Recent.* v. 2. pars. 2. p. 2.—*Ejusd. Sp. Musc.* pars 2. p. 23.—*Funck, Deutschl. Moose,* p. 52.—*Schwaeg. in Frankl. Journey to Polar Sea,* p. 756.

HYPNUM pennatum, *Hoffm. Fl. Germ.* 2. p. 57.

FONTINALIS pennata, *Linn. Sp. Pl.* p. 1571.

SPHAGNUM cauliferum et ramosum, foliis crispis, &c. *Hall. Helv.* 96. t. 3.

SPHAGNUM pennatum, undulatum, &c. *Dill. Hist. Musc.* p. 250. t. 32. f. 9.

HAB. On trunks of trees. Near Forfar, Mr DRUMMOND; rare.

Stems decumbent, rigid, filiform, producing numerous branches at right angles to itself, which are 1–3 inches long, and irregularly pinnate with smaller ones, frequently much attenuated at their extremities. *Leaves* rather bright green, bifarious, imbricated, spreading, some few erect and closely adpressed; ovato-lanceolate, serrulate at the apex, transversely undulate, nerve none or very short and indistinct: *perichætial leaves* lanceolato-acuminate, imbricated, nerveless. *Theca* ovate, reddish-brown, furnished with an extremely short seta, immersed among the perichætial leaves. *Lid* paler than the theca, convexo-conical, slightly and obliquely rostrate. *Outer peristome* of 16 lanceolato-subulate nearly colourless teeth, with transverse bars, which project into angles on each side: *Inner peristome* of 16 slender jointless processes, not half the length of the outer teeth.

To Mr DRUMMOND, nurseryman at Forfar, whom I have already had occasion to notice as a most deserving and indefatigable botanist, the British Flora is indebted for the discovery of native specimens of this highly interesting species. It is scarcely to be doubted, that his are the first which have been detected in this country, though HEDWIG, in his *Species Muscorum*, gives England as a general station without a question. The same author, however, in his prior work, the *Muscorum frondosorum descriptio et adumbratio*, says he received a specimen from DICKSON, but was ignorant whence he procured it. No additional particulars are before the public.

It is a widely distributed moss, having been found in most parts of Europe, at the Cape of Good Hope, and in North America. I have also received specimens from my friend Dr RICHARDSON, collected in his journey to the Polar Sea, and from the late Dr WRIGHT, gathered in Jamaica. The latter specimens are remarkable for the cauline leaves possessing more constantly a short nerve, than the European ones. In Dr RICHARDSON's plants, I also observed a nerve reaching half-way up some of the perichætial leaves. The nerve is indeed a very fallacious character in several of the distichous-leaved *Neckeræ*, being present in some, and nearly absent in other leaves on the same individual.

The acute MOHR seems to be the only muscologist who has described the leaves as serrulate at the apex. BRIDEL, on the other hand, observes: "Semper autem integerrima contra MOHRIUM video." The leaves of my specimens, however, which were delineated before I was aware of the above discrepancy, certainly are distinctly serrulate at the apex, as well as in those from Jamaica, and those received from Dr RICHARDSON. The inner peristome of *N. pennata*, is extremely fragile and evanescent, and apt to escape very minute observation.

Fig. 1. *Neckera pennata, nat. size.* Fig. 2. *Part of a branch.* Fig. 3. *A cauline leaf.* Fig. 4. *A perichætial leaf.* Fig. 5. *Theca with the lid.* Fig. 6. *Appearance of the peristome immediately after the removal of the lid.* Fig. 7. *View of a portion of the outer and inner peristome in their relative situation.* Fig. 8. *Sporules.*

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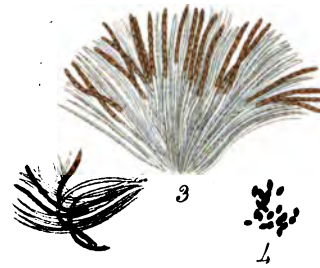

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STROMATOSPHÆRIA RUBIGINOSA.

Purplish effused Stromatosphæria.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *HYPOXYLA, De Cand. Grev.*

GENERIC CHARACTER.

Receptaculum varium, sessile, liberum vel erumpens. Sphærulæ latentes vel ore exserto; intus massa gelatinosa sporulifera instructæ.

Receptacle various, sessile, free or bursting through the bark. Spherules concealed, or furnished with an exserted orifice; filled with a gelatinous sporuliferous mass.

SPECIFIC CHARACTER.

STROMATOSPHÆRIA rubiginosa; *late effusa, subcrassa, rubiginosa, intus nigra, substantia minuta, subpulverulenta obtecta; sphærulis latentibus, rarissime subprominentibus; sporulis ovalibus.*

St. broadly effused, thickish, of a purplish red-brown colour, black within, the surface covered with a minute sub-pulverulent substance; spherules concealed, very rarely somewhat prominent; sporules oval.

SPHÆRIA rubiginosa, *Pers. Syn. Fung.* p. 11.—*Albert. et Schwein.* p. 4.—*Schwein. Syn. Fung. Carol.* No. 17.

HAB. On dead trunks and branches of trees. At Appin, on dead Beech-trees, Captain CARMICHAEL.

Receptacle plane, effused, one to several inches in breadth, 2–3 lines thick, irregular and undulate at the rounded margin, black within: the surface is covered with a minute pulverulent matter, which is sometimes accompanied by an excessively minute downy substance. *Colour* a reddish-brown, with a purplish tinge. *Spherules* quite concealed, or very rarely slightly prominent, seldom or never so in the centre, arranged irregularly in a double or triple series within the receptacle, and destitute of an orifice. *Sporuliferous tubes* numerous, long, filiform, containing 5–8 oval sporules.

Stromatosphæria rubiginosa is probably a rare species in this country, where it has been only recently discovered by Captain CARMICHAEL. The few authors who have described it, seem to mark it also as of general unfrequence. In North America, where even these humble plants seem to thrive with

peculiar luxuriance, M. SCHWEINIZ has often found this species to attain the enormous size of a foot in breadth.

It has long been my wish to render the study of this tribe of *Hypoxyla* more satisfactory, by reducing them to several *genera*. This is no easy task, and it is difficult to say whether such an attempt may eventually succeed. The number of species of *Sphæria* (already above 500) is, however, daily increasing, and seems to encourage such an undertaking.

Fig. 1. *Stromatosphæria rubiginosa, nat. size.* Fig. 2. *A section of a small plant.* Fig. 3. *Sporuliferous tubes.* Fig. 4. *Sporules.—All but* Fig. 1. *more or less magnified.*

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LEOCARPUS VERNICOSUS.

Varnished Leocarpus.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *GASTROMYCI, Link, Grev.*

GENERIC CHARACTER.

Sporangium subglobosum aut difforme. Peridium simplex, rumpens. Columella nulla. Sporulæ floccis inspersæ.

Sporangium subglobose or irregular. Peridium single, dehiscent. Columella 0. Sporules intermixed with filaments.

SPECIFIC CHARACTER.

LEOCARPUS vernicosus; *obovatus, nitidus, spadiceus, peridio fragili, stipite pallida basi membrana dilatato; sporulis massa nigra coacervatis.*

L. obovate, shining, chesnut colour, the peridium fragile; stipes pale, dilated at the base into a membrane; sporules forming a black mass.

LEOCARPUS vernicosus, *Link, in Berl. Mag.* v. 3. p. 25.—*Nees, Syst. Mycol.* t. 9. f. 110.—*Grev. Fl. Edin.* p. 453.

DIDERMA vernicosum, *Pers. Obs. Mycol.* 1. p. 89. t. 3. f. 7.—*Ejusd. Syn. Fung.* p. 165.—*Albert. et Schwein.* p. 89.—*Hook. Fl. Scot.* 2. p. 12.

LYCOPERDON fragile, *Dick. Fasc.* t. 3. f. 5.—*With. Bot. Arr.* ed. 6. v. 4. p. 458.—*Sow. Fung.* t. 136.—*Purt. Midl. Fl.* v. 3. p. 273.

HAB. On culms and leaves of grasses, the larger mosses, dead leaves, sticks, &c. Not unfrequent in the autumn.

Plants densely clustered, of a fine chesnut-brown, and so shining as to appear highly varnished. *Sporangium* near 2 lines high, obovate, pulpy when young, sometimes nearly sessile, but mostly furnished with a whitish stipes, which becomes expanded at its base into a small membrane. *Peridium* very smooth, extremely brittle, when broken exhibiting traces of an inner membrane, of a bright yellow colour: this seems rather to be the inner coat of the peridium, which is considerably thicker than in other plants of a similar structure. *Sporules* globose, very black, intermixed with filaments, the whole forming a compact roundish mass.

This small but beautiful genus was established by LINK, in his *Observationes in Ordines Plantarum naturales*. PERSOON had arranged it as a *Diderma*, from which it essentially differs, in the want of a columella. Two other species are described by LINK, viz.

L. *spermoides*, sporangiis globosis oblongisque luteis nitentibus, stipite brevissimo albente, floccis pallidis, sporulis atris.

HAB. On leaves, dead branches, &c. growing in a gregarious manner.

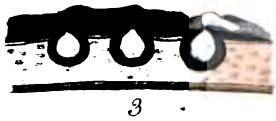
L. *calcareus*, sporangiis difformibus sessilibus crassis opacis albis, floccis pallidis, sporulis atris.

Sporangia 3–4 lines long. Peridia brittle, and having the appearance of being formed of a calcareous substance.

HAB. On the ground in dry grassy places.

Some botanists also add another species, by separating var. β from *Diderma vernicosum* of PERSOON under the name of *L. parasiticus*. This plant I prefer noticing in this place, as I am not sufficiently acquainted with it to decide whether it be really distinct or not. It was, (and is now!) described by WITHERING as *Lycoperdon parasiticum*, and is chiefly characterised by a nearly globular peridium, and cylindrical yellowish-white stipes.

Fig. 1. *Leocarpus vernicosus, nat. size.* Fig. 2. *Three sporangia.* Fig. 3. *A single sporangium.* Fig. 4. *Sporangium burst open.* Fig. 5. *Sporules and filaments.—All but* Fig. 1. *more or less magnified.*



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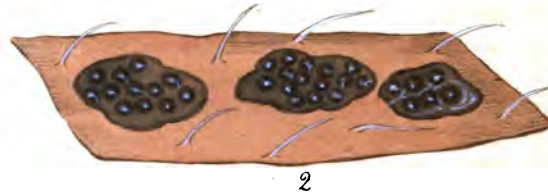

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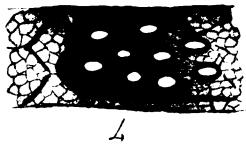

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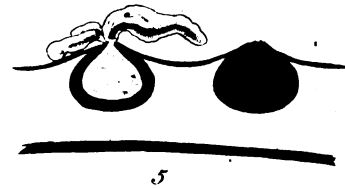

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SEPTARIA Ulmi.

Elm-leaf Septaria.

Class and Order CRYPTOGAMIA FUNGI, *Linn.*—Nat. Ord. *HYPOXYLA, De Cand. Grev.*

GENERIC CHARACTER.

Sphærulæ substantia foliorum immersæ. Sporidia cylindrica, pellucida, septata, sub forma cirrhi erumpentia.

Spherules immersed in the substance of leaves. Sporidia cylindrical, pellucid, jointed, escaping in the form of tendrils.

SPECIFIC CHARACTER.

Septaria Ulmi; *sphærulæ aggregatæ; sporidiis 3–4-septatis; cirrhis sæpe demum effusis.*

S. spherules aggregated; sporidia three or four times divided; the cirrhi often becoming effused.

Septaria Ulmi, *Fries, Novit. Fl. Suec.* V.—*Kunze, Mykol. Hefte,* 2. p. 107.
Fusidium septatum, *Schm. et Kunze, Deutschl. Schwaem.* 8. No. 182.
Sphæria ulmicola, *Bernardi, Stirp. rar. Sicil. Manip.* 3. p. 14.
Stilbospora? Uredo, *De Cand. Fl. Franç.* v. 6. p. 152.

Hab. On dead leaves of various species of Elm, (*Ulmus.*) Autumn. Near Lockerbie, Sir William Jardine, Bart.

Plant, having at first sight, and to the naked eye, the appearance of small, irregular, blackish, diseased spots, frequently running into each other, and often partly covered with an effused whitish substance. *Spherules* very minute, black, aggregated, immersed in the substance of the leaf, slightly prominent, and surrounded on the surface by a dark-coloured body, which is either a modification of a receptacle or an altered state of the epidermis, probably the former. *Sporidia* cylindrical, slightly curved, obtuse at each extremity, divided by 3–4 dissepiments, mixed with a white gelatinous substance, the whole escaping in the form of irregular short tendrils; often, however, becoming effused immediately after issuing from the spherule.

Almost every botanist who has had occasion to describe this plant, has bestowed upon it a different name, and referred it to a different genus. Fries at length, by forming a new

genus on purpose to receive it, has satisfactorily terminated the uncertainty respecting it. Of all the authors who have noticed it, BERNARDI seems nevertheless to have best understood its true structure; for, though difficult to dissect completely, on account of its minuteness, yet the spherules are very obvious, especially in a transverse section, as represented at Fig. 4. in the annexed plate. The situation of *Septaria* in a system, is unquestionably next to *Nœmaspora*, from which, as Dr KUNZE correctly observes, it essentially differs in the form and structure of the sporidia.

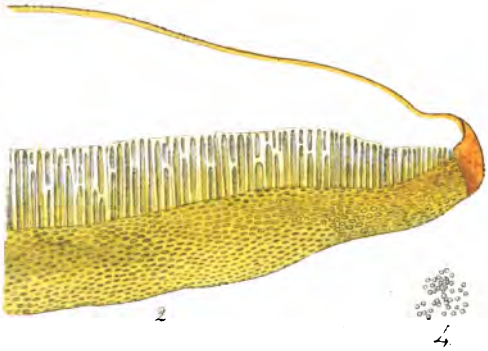
Another species (*S. oxycanthæ*) has been discovered on *Cratægus oxycantha*, by Dr SCHMIDT, and published by Dr KUNZE in Mykologische Hefte, 2. p. 108. It is remarkable for the numerous dissepiments in the sporidia. The specific character given in the above excellent little work, is

S. Oxycanthæ, sporidiis longissimis, curvatis, octo- ad duodecim septatis. HAB. On the green leaves of *Cratægus oxycantha*, in summer.

The spots in this species are on the upper surface of the leaf, of a dingy purple colour, with a yellow border; the cirrhi are yellowish-white, and extremely small.

Septaria Ulmi I had the pleasure of receiving from my active friend Sir WILLIAM JARDINE, Bart. several months ago. The genus itself is new to this country; and I trust I have contributed to render it more intelligible by accurate dissections.

Fig. 1. *A leaf with the parasitic Septaria, nat. size.* Fig. 2. *Plants magnified.* Fig. 3. *Spherules dissected in situ.* Fig. 4. *Transverse section of spherules.* Fig. 5. *Spherules more highly magnified.* Fig. 6. *Sporidia.—All except* Fig. 1. *more or less magnified.*



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POLYPORUS SULPHUREUS.

Sulphur-coloured Polyporus.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *FUNGI, Link, Grev.*

GENERIC CHARACTER.

Hymenium cum pilei substantia homogeneum et concretum, poris dissepimentis tenuibus simplicibus instructum.—Pileus subcarnosus vel suberosus, plerumque subsessilis, substantia fibrosa sicca, (Fries).

Hymenium of the same substance as the pileus, not separating from it, and furnished with pores connected by thin simple dissepiments.—Pileus subcarnose or corky, mostly subsessile; substance fibrous and dry.

SPECIFIC CHARACTER.

POLYPORUS sulphureus; *difformis, polymorphus, sessilis, pileis irregulariter imbricatis, glabriusculis, flavo- vel aurantio-rubris; poris minutis sulphureis.*

P. shapeless, polymorphous, sessile, the pilei irregularly imbricated, somewhat glabrous, yellowish or orange red, the pores minute, sulphur-coloured.

POLYPORUS sulphureus, *Fries, Syst. Mycol.* v. i. p. 357.

BOLETUS sulphureus, *Bull. Champ.* p. 347. t. 429.—*Sow. Fung.* t. 135.—*With. Bot. Arr.* ed. 6. v. 4. p. 397.—*De Cand. Fl. Franç.* ed. 3. v. 2. p. 120.—*Ejusd. Syn.* p. 24.—*Relh. Fl. Cantab.* ed. 3. p. 549.—*Purt. Midl. Fl.* v. 2. p. 671.—*Hook. Fl. Scot.* 2. p. 28. *et in Fl. Lond.* v. 4. t. 132.

BOLETUS citrinus, *Plan. Fung. Erfurt.* p. 26.—*Pers. Syn. Fung.* p. 524.—*Albert et Schwein.* p. 246.—*Schwein. Fung. Carol.* No. 885.—*Nees, Syst.* t. 28. f. 219.

BOLETUS caudicinus, *Schæff. Fung.* t. 131. & 132.—*Scop. Fl. Carn.* p. 524.—*Fl. Dan.* t. 1019.

BOLETUS ramosus, *Bull. Champ.* p. 349. t. 418.—*Pers. Syn. Fung.* p. 549.—*De Cand. Fl. Franç.* v. 2. p. 114.—*Ejusd. Syn.* p. 23.

BOLETUS coriaceus, *Huds. Fl. Angl.* p. 625.

BOLETUS tenax, *Lightf. Fl. Scot.* p. 1031.—*Bolt. Fung.* t. 75.

HAB. On trunks of trees, throughout the kingdom, but not of very frequent occurrence.

Plant very polymorphous in its shape, and unequal in size, composed of a number of mostly imbricated pilei, more or less grown together, so as to form one mass, from which the rounded and lobed margins of the pilei project, in a tiled manner, or shoot out into various excrescences, or even somewhat cylindrical, simple or divided branches: the whole sometimes

attaining two or three feet in breadth. *Colour* yellowish, orange, red, or a bright union of these hues, fading in age, the pores always of a fine sulphur tint. *Flesh* thick, white. *Pores* very numerous, minute, roundish, readily produced on any part of the fungus, according to situation and position. *Substance* light, spongy; when old, dry and friable, never coriaceous.

Mr PURTON observes, in his Midland Flora, "There can be no doubt but many of the Fungi, on their properties becoming better known, may be rendered subservient to various uses: with this impression, it may be worthy of notice, that *Boletus sulphureus* (more especially in the tubular part of it), has a remarkably pungent acid taste. This is retained by some dried specimens, which have been more than twelve months gathered." Several years ago, Dr SCOT of Dublin discovered that this species was occasionally covered with crystals of a salt, which he determined to be oxalic acid. These crystals, he observes, "were formed on the fungus in consequence of its drying, as none were observable while it remained on the tree." —*Linn. Trans.* v. 8. p. 262. Last autumn I found an enormous mass of this fungus attached to the trunk of an old willow-tree, and completely encrusted with a salt, which (without being aware of Dr SCOT's or Mr PURTON's observations) I communicated to my friend Dr THOMSON, the Professor of Chemistry in the University of Glasgow. That learned and indefatigable chemist decided it to be the Bin-oxalate of Potass. Thus, we may conclude, from the similar result of the two analyses, that this fungus has a remarkable, and, as far as we know, a peculiar property. This subject is highly deserving of investigation.

Pol. sulphureus in its young state, is whitish, soft, and presents nothing but a plane, convex, and somewhat effused surface.

Fig. 1. *A rather small specimen, nat. size.* Fig. 2. *Section of a portion of a pileus.* Fig. 3. *Pores.* Fig. 4. *Sporules.*—Figs. 3. *and* 4. *magnified.*

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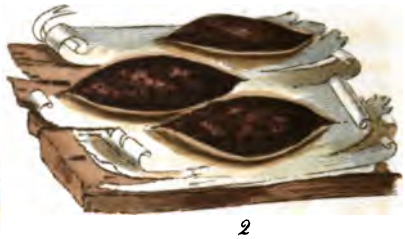

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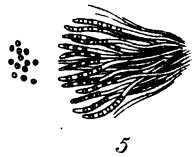

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STROMATOSPHÆRIA ELLIPTICA.

Elliptical Stromatosphæria.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *HYPOXYLA*, *De Cand. Grev.*

GENERIC CHARACTER.

Receptaculum varium, sessile, liberum vel erumpens. Sphærulæ omnino latentes vel ore exserto; intus massa gelatinosa sporulifera instructæ.

Receptacle various, sessile, free, or bursting through the bark. Spherules concealed, or furnished with an exserted orifice; filled with a gelatinous sporuliferous mass.

SPECIFIC CRARACTER.

STROMATOSPHÆRIA elliptica; *distincta, gregaria, submagna, elliptica, erumpens, fusco-ferruginea, minutissimo-pulverulenta, interne nigra, sphærulis omnino latentibus.*

St. distinct, gregarious, rather large, elliptical, erumpent, rusty-brown, the surface minutely pulverulent, black within; the spherules quite concealed.

STROMATOSPHÆRIA elliptica, *Grev. Fl. Edin.* p. 357.

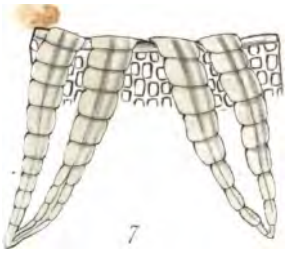
HAB. On the trunks and branches of decaying Birch trees *(Betula alba)*. Rare. Birch woods in the Highlands. Swanston Wood, near Edinburgh.

Plant distinct, very gregarious, bursting through the bark always in a transverse direction, of an elliptical general form, the two extremities acute; half an inch to near one inch in length. *Surface* nearly even, convex, minutely pulverulent. *Colour* a ferruginous-brown, within black. *Spherules* concealed within the receptacle, globose, destitute of an orifice. *Sporules* globular, contained in filiform diaphanous tubes.

This very distinct and remarkable species I first discovered on the banks of Loch Lomond, and subsequently near Edinburgh, but in both localities very sparingly. It is not described in any work to which I have access; nevertheless it may have found a place in the concluding part of the second

volume of the Systema Mycologicum of FRIES, which I understand has already appeared on the Continent.

Figs. 1. & 2. *St. elliptica, nat. size.* Fig. 3. *A receptacle divided.* Fig. 4. *Portion of the receptacle, with spherules.* Fig. 5. *Sporuliferous tubes and sporules.*



ORTHOTRICHUM DRUMMONDII.

Drummond's Orthotrichum.

CLASS AND ORDER CRYPTOGAMIA MUSCI, *Linn.*—NAT. ORD. *MUSCI, Juss. De Cand. Hook.*

GENERIC CHARACTER.

Seta terminalis. Peristomium plerumque duplex; ext. e dentibus 16 *per paria vel unitis vel approximatis; int. e membrana lacerata erecta, aut ciliis* 8–16 *vel nullis. Calyptra mitriformis.—Columella non capitata.*

Seta terminal. Peristome mostly double; ext. one of 16 teeth approaching or united in pairs; int. one of an erect lacerated membrane or 8–16 ciliæ, or wanting. Calyptra mitriform.—Columella not capitate.

SPECIFIC CHARACTER.

ORTHOTRICHUM Drummondii; *foliis oblongo-lanceolatis subcrispatulis; seta elongata; theca clavata, sulcata; operculo longe rostrato; peristomio simplici e dentibus* 16 *reflexis, basi liberis, sed per paria apicibus plerumque unitis; calyptra valde pilosa.*

O. leaves oblong-lanceolate, slightly crisped; seta elongated; theca clavate, furrowed; lid with a long beak; peristome simple, of 16 reflexed teeth, free at their base, but mostly united in pairs at their extremities; calyptra very hairy.

ORTHOTRICHUM Drummondii, *Hook. & Grev.* MSS.

HAB. Trunks of trees. Glen Fallach, Messrs HOOKER, ARNOTT and GREVILLE. Near Forfar, abundant, Mr DRUMMOND. Angusshire and Perthshire, Mr MACVICAR.

Stems somewhat creeping, 1–2 inches in length; branches rather short, erect, tufted, mostly very dark coloured except at the summits. *Leaves* oblong-lanceolate, somewhat carinate and recurved at the margin, slightly crisped when dry. *Seta* elongated, twisted. *Theca* long, clavate, deeply sulcate. *Lid* conical, with a long beak. *Peristome* simple, of 16 linear-lanceolate, reflexed teeth, marked by a longitudinal line, free at their base, but mostly united in pairs at their apex: each of the pairs in the dry theca forms so projecting an angle at its base, that the orifice is almost closed, a character exceedingly striking even to the naked eye. *Calyptra* very hairy.

Among the various species that have within a short period been added to the genus Orthotrichum, none can be adduced as more distinct, and at the same more time liable to be overlooked, than the subject of the present plate. Among those with a single peristome, the only one to which it approaches in general habit, is *O. anomalum*, at least that variety of *O. anomalum* which is occasionally found on trees; from this, the teeth, the longer and narrower theca, and more hairy calyptra, are alone sufficient marks of distinction. It comes far nearer, however, to some with a double peristome, especially to *O. Hutchinsiæ* and *O. crispum*, for the latter of which it has doubtless been hitherto mistaken. As *O. Hutchinsiæ* never (?) occurs on trees, *O. crispum* is the one most likely to be gathered for our present plant, and it is fortunate that the inner peristome of *O. crispum* is very permanent, and easily seen even by the naked eye, forming an arch over the mouth of the theca; the leaves, too, are far more highly crisped. Thus, on the other hand, the straighter leaves, the single peristome, the longer and narrower teeth, and almost closed orifice of *O. Drummondii*, are the best general characteristics of that species.

O. Drummondii is probably not unfrequent in Scotland, and, although at the time ignorant of the minuter specific distinctions, I pointed it out to Dr HOOKER as distinct from *O. crispum* last year in Glen Fallach. The zealous Mr DRUMMOND having also discovered it, its characters were speedily determined, and his name bestowed upon it by Dr HOOKER and myself, with that pleasure which the true naturalist ever feels in acknowledging the merits of an active and intelligent discoverer.

Fig. 1. *O. Drummondii, nat. size.* Fig. 2. *Upper leaves.* Fig. 3. *Lower leaf.* Fig. 4. *Theca nearly mature, with the lid.* Fig. 5. *Old theca,* Fig. 6. *Calyptra.* Fig. 7. *Portion of the peristome.* Fig. 8. *Apex of one of the pairs of teeth.* Fig. 9. *Sporules.*

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DICRANUM Schreberianum.

Schreber's Dicranum.

Class and Order CRYPTOGAMIA MUSCI, *Linn.*—Nat. Ord. *MUSCI, Juss. De Cand. Hook.*

GENERIC CHARACTER.

Seta terminalis. Peristomium simplex e dentibus 16 *bifidis. Calyptra dimidiata.*—Hook.

Seta terminal. Peristome simple, of 16 bifid teeth. Calyptra dimidiate.

SPECIFIC CHARACTER.

Dicranum Schreberianum; *caule erecto, simplici; foliis undique divergentibus, longe subulatis, basi ovato-dilatatis undulatis amplexicaulibus; theca ovata cernua, struma instructa, operculo longe et oblique rostrato.*

D. stem erect, simple; leaves spreading on all sides, elongato-subulate, dilated into an ovate form at the base, waved and amplexicaul: theca ovate, cernuous, furnished with a struma; lid long and obliquely rostrate.

Dicranum Schreberianum, *Hedw. Sp. Musc.* p. 144. t. 33. f. 6–10.—*Sturm, Deutschl. Fl. cum icone.—Moug. et Nestl. Stirp. Crypt. Vog.* No. 719.—*Funck, Deutschl. Moose,* t. 21.

Dicranum Schreberi *Swartz, Musc. Suec.* p. 37. t. 2. *fide Hedwig.*

Bryum crispum, *Schreb. Spicil.* p. 79.

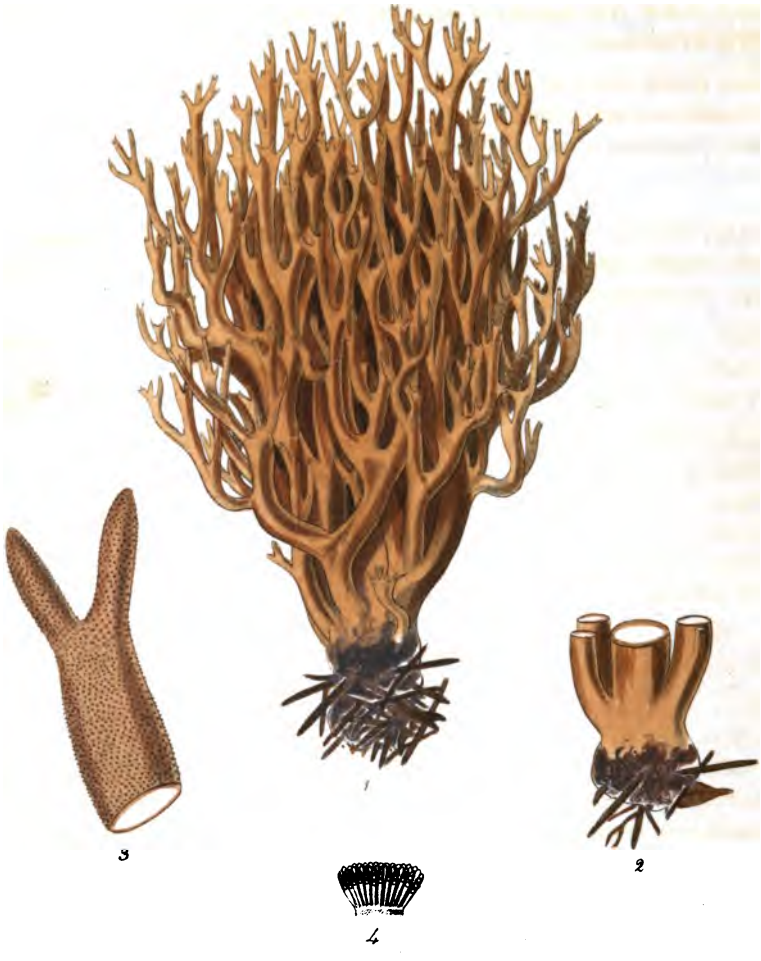
Hab. Moist argillaceous places, rare. Glen Tilt, Messrs Hooker, Arnott and Greville.

Plant growing in a crowded manner. *Stem* simple, very erect, 2–6 lines high. *Leaves* rather distant, bright green, patent, embracing the stem with their sheathing bases, ovate, with a waved margin, and rather suddenly attenuated into a very narrow long flexuose entire extremity; nerve passing into the narrow portion, and there gradually disappearing about half way up. *Theca* smooth, ovate, cernuous, fine red, provided with a struma. *Lid* conico-subulate, the beak long and oblique. *Peristome* of 16 slender red teeth, cleft about half-way down.

This very interesting addition to the Bryology of Great Britain, I have already alluded to in a former number. It will be sufficient to mention here, that Mr Walker Arnott

was the first to ascertain the discovery on our return from the Mountains, where we had all hastily gathered it for an unusually fine state of *Dicranum varium*. It is with this moss that *D. Schreberianum* has the greatest affinity. It is, however, well distinguished from it, by the dilated and undulated base of the leaves, which moreover embrace the stem, and spread equally on every side; whereas in *D. varium*, they are narrow-lanceolate or lanceolato-subulate, not in the least waved at the margin towards the base, are more rigid, erect, and in a greater or less degree secund, (directed to one side.)

Fig. 1. *Dicranum Schreberianum, nat. size.* Fig. 2. *A plant magnified.* Fig. 3. *Lower leaf.* Fig. 4. *Upper leaf.* Fig. 5. *Calyptra.* Fig. 6. *Portion of the peristome.—All except* Fig. 1. *more or less magnified.*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CLAVARIA ABIETINA.

Fir-wood Clavaria.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *FUNGI, Link, Grev.*

GENERIC CHARACTER.

Plantæ carnosæ, plus minusve cylindraceæ, simplices vel ramosæ. Hymenium lævе, omnem fere superficiem occupans, cum stipite confluens. Sporulæ albidæ vel ochraceæ.

Carnose plants, more or less cylindrical, simple or branched. Hymenium smooth, occupying almost the whole surface, and confluent with the stipes. Sporules white or ochraceous.

SPECIFIC CHARACTER.

CLAVARIA abietina; *obscure ochracea, ramosissima, caule brevi, basi albo-tomentoso, ramis confertis erectis, strictis, teretibus, subrugosis, ramulis acutis, furcatis, attenuatis.*

CL. dull ochrey-yellow, very much branched; stipes short, covered with white down at the base; branches crowded, erect, straight, round, slightly rugose, the ramuli acute, forked, attenuated.

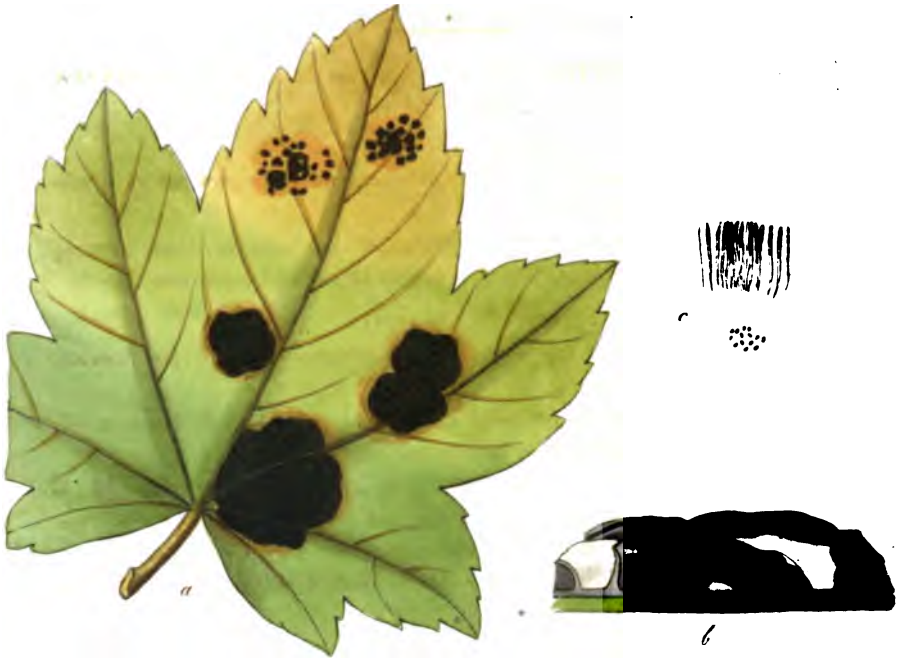
CLAVARIA abietina, *Vers. einer Syst. Einth. der Schwæmme in Rœmer's N. Bot. Mag.* p. 117. *(fide Pers.)*—*Pers. Comment.* p. 46.—*Ejusd. Disp. Meth. Fung.* p. 37.—*Ejusd. Syn. Fung.* p. 589.—*Ejusd. Mycol. Europ.* 1. p. 164.—*Albert et Schwein.* p. 286.—*Schum. Enum. Sælland, (fide Fries.)*—*Fries, Syst. Mycol.* v. i. p. 469.—*Schwein. Fung. Carol.* No. 1078.—*Grev. Fl. Edin.* p. 412.

HAB. On the ground in Fir-woods, or under Fir-trees. Woods at Balmuto. Autumn.

Plant gregarious, 2–4 inches high, erect, compact, of a dull ochrey-yellow colour, which, on injury, changes to a greenish hue. *Stipes* solid, very short, half an inch thick or more, clothed at the base with a whitish down. *Branches* few and thickish at first, but soon dividing and becoming very numerous, erect, round, the axils obtuse; *ramuli* attenuated, minutely and acutely forked at their apex. *Flesh* white. *Sporules* ochraceous, globose, in short, clavate, tubular cells, from which they escape, and render the surface of the branches pulverulent.

An exceedingly well-marked species, and to the best of my knowledge not described as a British plant. The very erect and compact mode of growth is highly characteristic. The taste is bitter, and most specimens become of a green hue on being crushed or injured. All authors agree in stating its general locality to be Fir woods and plantations.

Fig. 1. *Clavaria abietina, nat. size.* Fig. 2. *A transverse section of the stipes.* Fig. 3. *Summit of a branch.* Fig. 4. *Sporuliferous tubes and sporules.*— Figs. 3. & 4. *magnified.*



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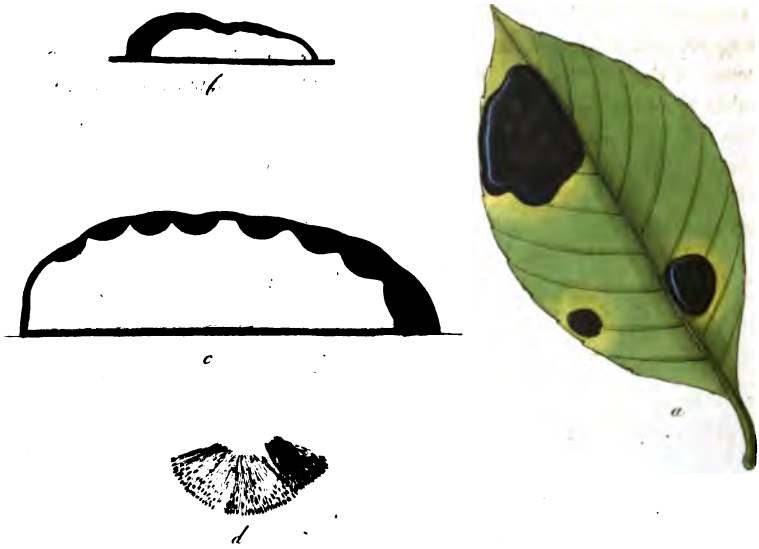


XYLOMA ACERINUM.

Sycamore-leaf Xyloma.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *HYPOXYLA, De Cand. Grev.*

GENERIC CHARACTER.

Perithecia nigra, cornea, clausa aut irregulariter dehiscentia, vel minuta et solitaria vel majora et confluentia.

Perithecia (the part enclosing the sporular mass) black, corneous, bursting irregularly, either minute and distinct, or larger and confluent.

SPECIFIC CHARACTER.

XYLOMA acerinum; *tenue, late maculæforme, subrugosum; perithecia flexuosa, contigua, dehiscentia, intus albida.*

X. thin, broad, in the form of spots, subrugose; perithecia flexuose, contiguous, dehiscent, whitish within.

XYLOMA acerinum, *Pers. Meth. Fung.* p. 6.—*Syn. Fung.* p. 104.—*Alb. et Schwein.* p. 63.—*De Cand. Fl. Franç.* ed. 3. v. 2. p. 302.—*Ejusd. Syn.* p. 63.—*Nees, Syst.* t. 2. f. 21. *a.*—*Moug. et Nestl. Stirp. Crypt. Vog.* No. 77.—*Schwein. Fung. Carol.* No. 266.—*Hook. Fl. Scot.* 2. p. 9.—*Grev. Fl. Edin.* p. 367.

XYLOMA punctatum, *Pers. Obs. Mycol.* 2. 101.—*Ejusd. Syn. Fung.* p. 104.—*Alb. et Schwein.* l. c. p. 63.—*De Cand.* l. c. p. 303.—*Syn. Fung.* p. 63.—*Schwein. Fung. Carol.* No. 267.

SPHÆRIA maculæformis, *Ehrh.*

SPHÆRIA subconfluens? *Purt. Midl. Fl.* v. 3. p. 284. (not of SOWERBY.)

MUCOR granulosus, *Bull. Champ.* p. 109. t. 504. f. 13.

HAB. On the leaves of the common Plane tree, and also on *Acer Platanoides* and *campestris*. Very common.

Perithecia very confluent, forming thin, broad, black spots, from a few lines to near an inch in diameter, the margin often irregular; surface somewhat rugose, and impressed with flexuose lines, which mark the future dehiscence of the perithecia. The perithecia are whitish within, and, in favourable circumstances, open freely, and discharge their contents. *Sporuliferous tubes* filiform. *Sporules* very minute, oval. The variety called *punctatum* is composed of generally distinct irregular spots, half a line to a line broad, but very frequently passing by insensible gradations into the common form.

This plant is so very frequent on almost every tree of the common Sycamore, that it is unnecessary to describe it more minutely. Most authors have agreed in keeping up the two species I have brought together, and which I consider with the

learned NEES AB ESENBECK to be merely different states of the same plant. Both may often be seen passing into each other on the same leaf. Both varieties are represented in the annexed plate.

Fig. 1. a, *Xyloma acerinum, nat. size.* b, *Perithecia open.* c, *Sporuliferous tubes and sporules.*

XYLOMA SALICINUM.

Thick Sallow-leaf Xyloma.

SPECIFIC CHARACTER.

XYLOMA salicinum; *perithecia confluentia in receptaculo cartilagineo, albido, crasso, vix dehiscentia, externe subtuberculosa.*

X. perithecia confluent in a white thick cartilaginous receptacle, scarcely dehiscent, externally subtuberculose.

XYLOMA salicinum, *Pers. Meth. Fung.* p. 5. t. 2. f. 4.—*Ejusd. Syn. Fung.* p. 103.—*Alb. et. Schwein.* p. 62.—*Purt. Midl. Fl.* v. 3. p. 318.—*Grev. Fl. Edin.* p. 368.

XYLOMA leucocreas, *De Cand. Fl. Franç.* ed. 3. v. 2. p. 303.—*Ejusd. Syn.* p. 63.—*Moug. et Nestl. St. Crypt. Vog.* No. 175.

HAB. Frequent on the living leaves of the common Sallow (*Salix caprœa*), in the autumn.

Size extremely variable, even from that of a pin's head to above half an inch in diameter, and fully two lines in thickness. *Margin* rounded, irregular. *External surface* deep shining black, somewhat tuberculose. Within white, very firm, hard, cartilaginous. *Perithecia* very small, situated immediately beneath the surface, roundish, very rarely opening. *Sporuliferous tubes* and *sporules* so slender and minute that the highest magnifying power does not exhibit their nature distinctly.

PERSOON mentions that he has seen the perithecia of this species dehiscent. DE CANDOLLE, on the other hand, never succeeded in perceiving them in that state. To the latter testimony I must add my own, though I have regularly sought for the open perithecia whenever I have met with the plant. Mr PURTON is surely in error when he quotes *Xyloma? striæforme* of MOUGEOT and NESTLER.

Fig. 2. a, *X. salicinum, nat. size.* b, *A section.* c, *A section exhibiting the perithecia magnified.* d, *Sporuliferous mass highly magnified.*

AGARICUS COMATUS.

Tall cylindrical Agaric.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *FUNGI, Link, Grev.*

DIV. * COPRINUS, *Fries.*—SECT. V. COPRINUS, *Pers.*

GENERIC CHARACTER.

Pileus stipitatus aut latere affixus, subtus lamellis sporiferis, rectis simplicibus. Volva nulla.

Pileus furnished with a stipes, or fixed by its side, having on the under surface straight, simple, sporuliferous lamellæ. Volva none.

SPECIFIC CHARACTER.

AGARICUS comatus; *pileo subcarnoso, albo, squamoso, primo cylindraceo dein campanulato, deliquescenti; lamellis albis demum purpurascentibus; stipite subbulboso, annulo mobili.*

AG. pileus somewhat carnose, white, scaly, at first cylindrical at length campanulate, deliquescing; lamellæ white, changing to reddish-purple; stipes somewhat bulbous, with an annular moveable veil.

AGARICUS comatus, *Pers. Disp. Fung.* p. 62.—*Ejusd. Syn. Fung.* p. 395.—*Alb. et Schwein.* p. 199.—*Schwein. Fung. Carol. Sup.* No. 701.—*Schmidt, Icon.* t. 10. *fide Fries.*—*Fries, Syst. Mycol.* v. 1. p. 307.—*Grev. Fl. Edin.* p. 393.

AGARICUS comarus, *Fl. Dan.* t. 834.

AGARICUS cylindricus, *With. Bot. Arr.* ed. 6. v. 4. p. 347.—*Schæff. Fung.* t. 8.—*Sow. Fung.* t. 189. (*bene.*)—*Relh. Fl. Cantab.* ed. 3. p. 539.—*Winch, Bot. Guide,* 2. p. 90.—*Purt. Midl. Fl.* v. 2. p. 651.—*Hook. Fl. Scot.* 2. p. 23.

AGARICUS fimitarius, *Huds. Fl. Angl.* p. 617.—*Lightf. Fl. Scot.* p. 1021.—*Bolt. Fung.* t. 44.—*Curt. Fl. Lond.* ed. 1. *cum icone.*

AGARICUS typhoides, *Bull. Champ.* p. 405. t. 16. & t. 582. f. 2.—*De Cand. Fl. Franç.* ed. 3. v. 2. p. 145.

AGARICUS ovatus, *Schæff. Fung.* t. 7.

AGARICUS porcellaneus, *Schæff. Fung.* t. 46, 47.

HYDROPHORUS comatus, *Batt. Fung.* t. 26.

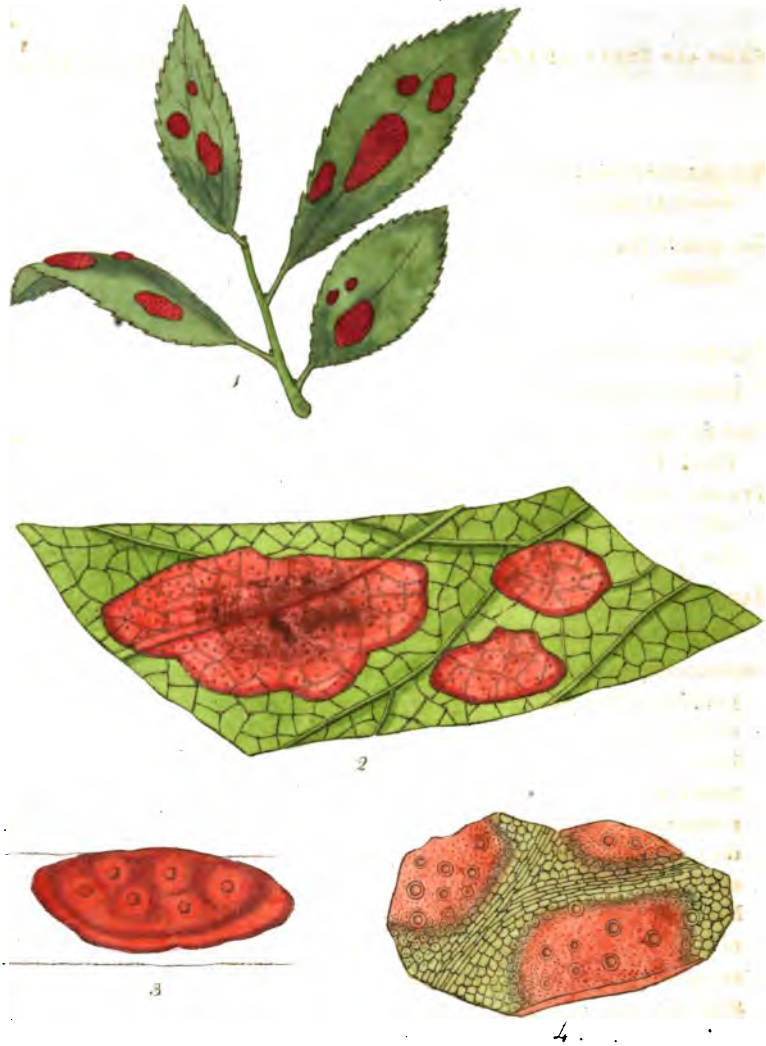
HAB. In meadows, grass-plots, and waste places; frequent, in the autumn.

Large, gregarious, not tufted. *Pileus* when young oblongo-cylindrical, at length conico-campanulate, 3–6 inches from the base to the apex, white, the summit tinged with brown, and the surface more or less covered with large shaggy scales. As the plant grows old, the white colour gives place to a shade of reddish-brown, and the lower part becomes so thin

that the lamellæ are seen through its substance, of a dull orange colour. *Lamellæ* free, contiguous to each other, white, at length reddish-purple, in decay changing to black, and deliquescing along with the pileus. *Stipes* smooth, long, erect, cylindrical, white, with an annular moveable veil; hollow, but with a cord of filaments in the cavity; somewhat bulbous at the base, and terminating below the bulb in a short attenuated radicular process.

A very handsome agaric, and very satisfactorily characterised: indeed, I do not know any with which it can be confounded. In decay, like all those of the division in which it is placed, it melts into an inky black fluid. If this fluid (according to BULLIARD) be boiled with a little water and a few cloves, to prevent it becoming mouldy in keeping, and passed through a filtre, we shall have an excellent bistre-coloured ink for the use of the pencil. It may be procured in any quantity by collecting the fungus, which discharges the fluid spontaneously.

All the figures are of the natural size, and, except the lower one, represent the fungus in different states.



POLYSTIGMA RUBRUM.

Red Polystigma.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *HYPOXYLA*, *De Cand. Grev.*

GENERIC CHARACTER.

Receptaculum tenue carnosum (aurantiacum) epiphyllum punctatum. Sphærulæ immersæ minutæ.

Receptacle thin, carnose (orange), epiphyllous, dotted. Spherules immersed, minute.

SPECIFIC CHARACTER.

POLYSTIGMA rubrum; *planum, aurantiaco-rubrum; sporulæ inæquales globosæ.*

P. plane, orange-red; sporules unequal, globose.

POLYSTIGMA rubrum, *Pers. in Moug. et Nestl. St. Crypt. Vog.* No. 270.—*De Cand. Fl. Franç.* v. 5. p. 164.—*Grev. Fl. Edin.* p. 365.

XYLOMA rubrum, *Pers. Obs. Mycol.* 2. p. 101.—*Ejusd. Syn. Fung.* p. 105.—*Alb. et Schwein.* p. 64.—*De Cand. Fl. Franç.* ed. 3. v. 2. p. 599.—*Ejusd. Syn.* p. 63.—*Purt. Midl. Fl.* v. 3. p. 316. t. 33.—*Hook. Fl. Scot.* 2. p. 9.

HAB. On the upper surface of the leaves of the Sloe-tree (*Prunus spinosa*). Summer and autumn; not unfrequent.

Commencing at first by a yellow or orange discoloration in the leaf, which gradually thickens and becomes more defined, at the same time darker in colour, and exhibiting numerous minute dots dispersed over the surface. When mature, the plant is of various sizes, from 1–6 lines in diameter, of a deep orange-red, and thin carnose substance; generally of a roundish or oblong form, but in this respect extremely variable. The dots on the surface are visible to the naked eye, and mark the situation of the concealed *spherules*, whose orifice, however, under the microscope, has escaped my observation. These spherules lie in the very substance of the leaf, which is converted by a thorough change in its nature into a receptacle; this is very remarkably obvious in a transverse section or slice, as given at Fig. 4. in the plate. *Sporules* naked, of different sizes, globular, fine orange.

This is an interesting plant, and not without considerable claims to beauty; for these inferior vegetables have degrees of

beauty among themselves, and are doubtless as admirably fitted to fulfil the ends for which they were designed, as the most noble, or, as LINNÆUS has called them, the princes of the same kingdom to which they belong. The subject of the present plate is very conspicuous, even at some distance, from its beautiful colour.

The genus *Polystigma* is a small one, containing only two additional species, both of which are found in Great Britain, viz.

P. *fulvum*; plane; colour pale fulvous. *Pers. in Moug. et Nestl.* No. 271.
HAB. On the leaves of the *Prunus Padus*.

P. *typhinum*; pale yellow-orange, investing the culms of living grasses. *De Cand. Mém. du Mus. d'Hist. Nat.* v. 3. Sphæria typhina, *Pers. Syn. Fung.* p. 29.—Sphæria spiculifera, *Sow. Fung.* t. 274. (incorrect.)

The last, though it does not entirely accord with *Polystigma*, yet agrees still less with any other known genus. I therefore follow DE CANDOLLE, who has shown considerable acuteness in referring it to this place. Some authors regard *P. fulvum* as a variety of *P. rubrum*. This may be correct; but until I have examined the former more minutely, I cannot help regarding them as distinct.

Fig. 1. *Polystigma rubrum, nat. size on Prunus spinosa.* Fig. 2. *Plants, magnified.* Fig. 3. *A plant more highly magnified.* Fig. 4. *A horizontal section.* Fig. 5. *A vertical section.* Fig. 6. *Sporules.*

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[a] This plant is described in the body of the work under the name of *trichopus*, but Persoon having called another species by that name, I have substituted that of *setipes*.

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